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#31 — Volume 3, number 7

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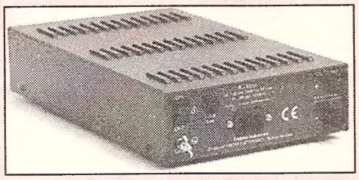

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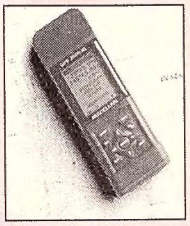

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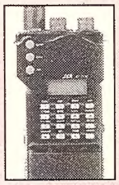

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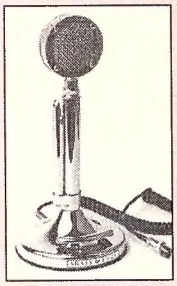

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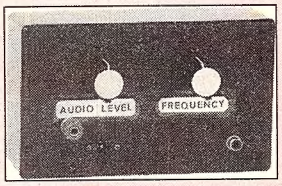

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Don't miss out! YOU could win it!

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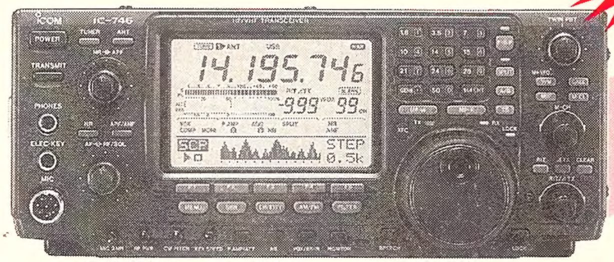

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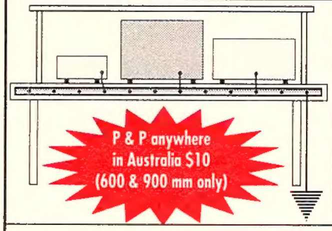

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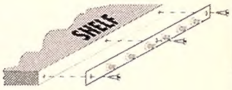

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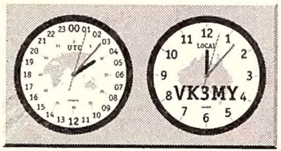

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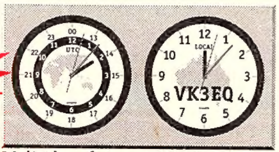

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# Editorial Comments...

I have in my hand at the moment an incredible, unbelievable masterpiece of miniaturisation. So small is it that we just burst into incredulous laughter when we opened the box a few days ago. It *must* be a joke... Get this: imagine a full-featured scanner which covers 500kHz to 1000MHz in AM, narrow FM and quality wide FM, has several hundred memory channels, yet can run from a single AA 'penlite' cell or from its supplied rechargeable lithium ion battery pack, and weighs barely more than an ounce in the old money. Oh, and is so small that it's dwarfed by the palm of a hand...

But wait, as those infuriating TV adverts used to say — *it transmits too*! Yep, this is the all-new **Yaesu VX-1R** dual-band amateur hand-held transceiver!

Sorry, but don't bother looking for the review in this issue. We weren't kidding when we said it had only just arrived here. We've hardly had a chance to scratch the surface with this one, but believe us when we say it is quite remarkable. And when you consider that the battery takes up around half of its internal space... well, it just leaves the mind reeling.

The power output is fairly low (up to a watt, but how they even get *that* much from it is astounding!), but if you can hear its signal you will be quite taken aback. You see, it *sounds* like a good quality mobile transceiver, not a shrimp. No, this isn't the April 1st edition. The VX-1R is for real. It's so small that Yaesu couldn't even fit its traditional "FT" into the model number! Perhaps that's taking it too far, but a proportion of amateurs will definitely find this radio a 'must have'. At what price? That has yet to be set... but we now know it *will* be sold here, so keep an eye on your local Dick Smith store for word of price and availability.

There's a whole rash of enticing new amateur transceivers around the corner. Icom, Kenwood and Yaesu are all poised to drop a number of newbies into the showrooms, and we have a sneaking suspicion we're going to have to polish up a few old superlatives very soon. The best... the fastest... the brightest... and, of course, "how on Earth did they make it do *that*?"!

They're getting ready for the big activity of the solar cycle. Some might say that perhaps it's just a cynical marketing ploy, pulling all of these cute little rabbits from the hat just as the HF bands wake up, but we think not. In some ways, it seems that amateur radio is still running ahead of the pack — introducing new concepts and new ideas at the leading end of technology.

A couple of these new radios cover HF right through to 70cm, and give a pretty reasonable account of themselves, too. From what we can make out, two major manufacturers are racing to hit the market first. That's no wonder — if what we've read on the Web is accurate, the radios bear an uncanny resemblance to each other, at least in terms of specification and capability.

Maybe it is a good time to bring these things out. As I type this in mid-December, there's loads of activity on six, two and 70cm from all around the traps. 10 metres is open to everywhere, too. I heard a few 10M FM repeaters from the US today... in fact, they're still coming through at S9, so I guess the 11M gang must be having a bit of fun, too. Long live Cycle 23!

I had a call from Steve Gregory, VK3OT, the other day. For those who may not know Steve, he's southern Australia's undisputed king of the capricious six metre band. A friend and long-time contributor to the magazine, Steve was the first Australian radio amateur to achieve the DXCC award (100 countries worked and confirmed) exclusively on the six metre (50 to 54 MHz) band. His news is that he leaves for Alaska in a couple of days, where he'll be living for quite some time. I doubt it will be long before there's a big six metre antenna pointed in this general direction, so keep your ears open and you'll probably catch him there, looking out for you. Have a good trip, mate, and don't get too cold...

You know, talking about antennas, if we put any more of them into this edition of the magazine, I reckon they'd try to make us pay sales tax on all the wire and aluminium! Just check this out — we review a log periodic Yagi for scanner users, watch as Neville from Geraldton builds an exhaust pipe special (a really big quad for 11M), then go to the other extreme with a tiny active HF receiving antenna project. That's not the only project, either. That prolific tinkerer, Harold Hepburn, VK3AFQ, has been at it again, and this month describes a simple audio filter project we could all benefit from using.

We also check out something I first encountered way back when... The **Astatic D104** microphone. Come on, don't laugh. This is a *new* one! Yes, a microphone which first saw the light of day in 1933 is *still* in production. It may have more chrome than a Cadillac (probably weighs as much too!) but these mics quickly built a towering reputation as simply the thing to have in a modern shack. And why not? They work as well in the '90s as they did in the '30s.

And we ran a picture in this column of the new **Icom IC-40S** a couple of issue ago (then stuck Icom's advert with another picture of it right opposite!). We've already checked it out, and if *you* want to check it out as well, read the review, why not try to *win* it from us? Couldn't be easier! Ah, it must be Christmas... want a GPS receiver as well? You can win our review unit too.

I guess you'll need a source of electricity to run all this stuff. Better check out our Aussie power supply story. And even if you're not even remotely into CB, I'd recommend the monthly ACBRO column to you this time. Get the magnifying glass out and head for Page 70. We haven't heard the end of this yet. End of what? The ACA is considering allowing a few new users onto CB, and is ACBRO up in arms or what?

And we need *your* help with repeater lists. If the lists are to be of any worth to you whatever, we need *you* to tell us all about the repeaters in your area. Please. Don't just assume that someone else will do it, or that repeater operators automatically think of us when they QSY, fire up or give it away. Just whip out to the radio, key up everything you can hear, and tell us about it. Be it Email, fax, letter or carrier pigeon, we're easy. Just let us know what you can hear in your area, and what you know about them (like where they are, the area they serve, the frequency or channel they operate on, and so on). That way, other operators visiting your area will have some valuable, correct and useful information. And this applies equally to CB and amateur repeaters, as you'll discover by reading **Feedback** on Page 86...

Okay, that's enough from us once again. How quickly another year has flown by. We radio buffs are the winners, you know. Just look back through the last 12 issues and see what amazing new goodies have quietly snuck into the shack! Got those resolutions sorted out, and the 'bonus' requests in to Santa?

From Len, Chris and Kate, and our whole team of very dedicated regular writers, we wish each and every one of you the very best wishes for 1998, and we trust Santa will bring you exactly what you've wished for in an overflowing stocking.

We'll see you again next year. The very warmest of wishes until then from the whole team.

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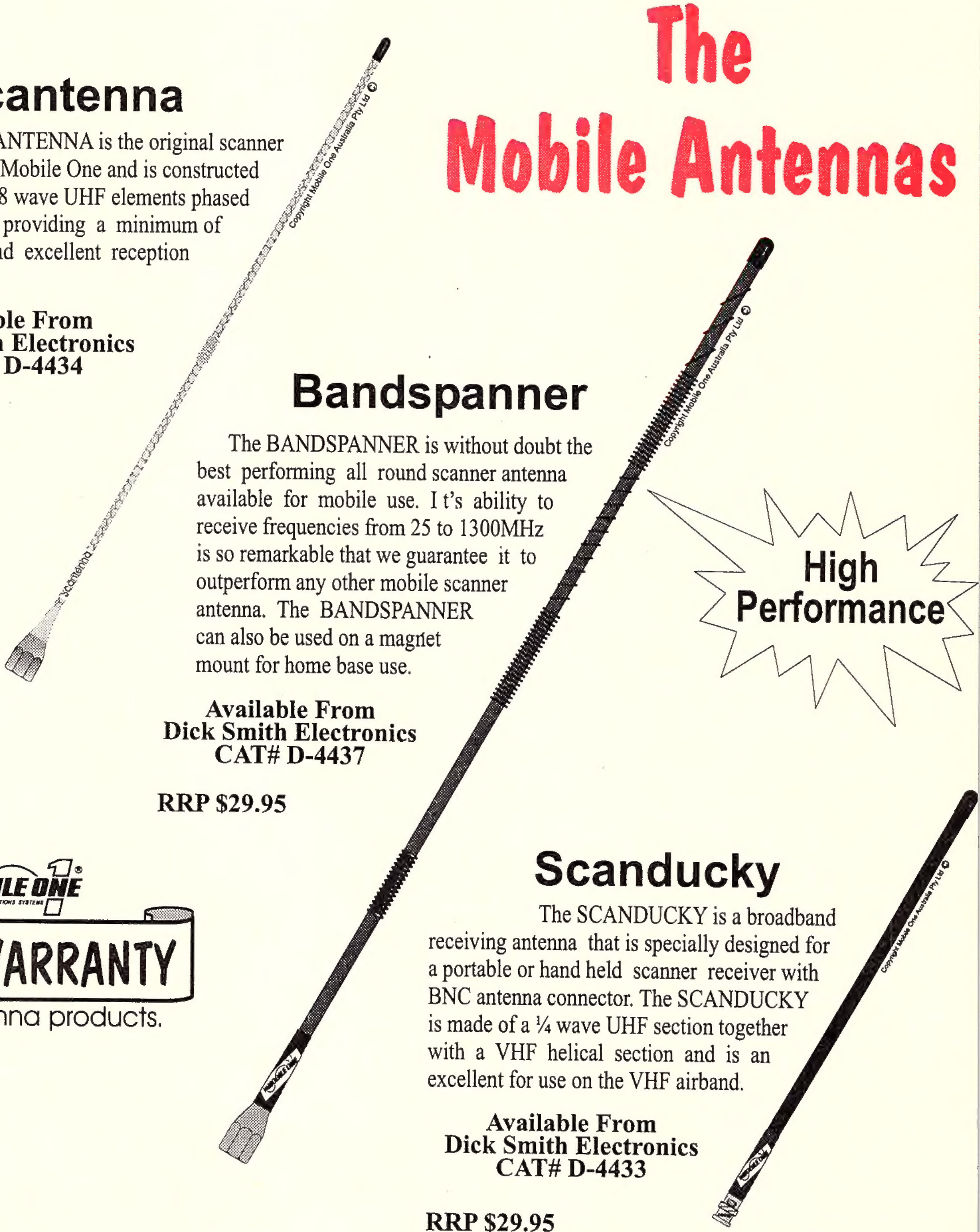
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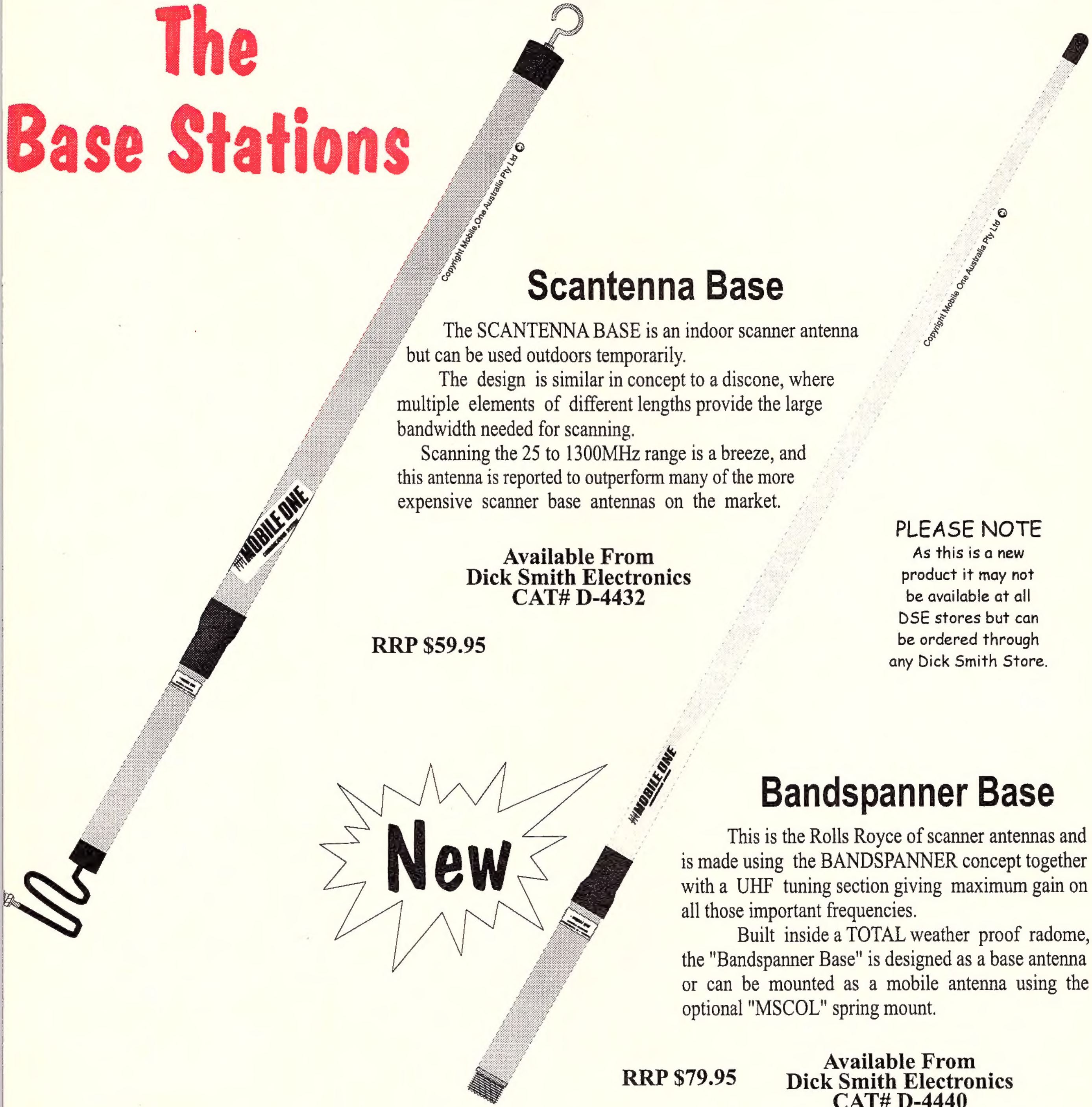
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# Icom IC-40S

## "Is this the world's best UHF CB radio?"

asks Ken Reynolds...

Don't be misled by the apparent simplicity of its countenance — Icom's brilliant new IC-40S is, without doubt, the world's best UHF CB transceiver, offering just the right formulation of size, performance and unprecedented ruggedness combined with a range of features and well-priced accessories that will knock you out.

It's been a long time coming...

UHF CB radio in Australia is now entering its third decade and, like a fitting tribute to a unique citizens' radio service, Icom Australia has introduced the world's best hand-held UHF CRS transceiver.

It seems an eternity since Icom's first foray into UHF CB crystallised in the shape of the IC-40, which was wrought from the IC-4E, an amateur, 70cm UHF hand-held transceiver of the era. It employed thumb-wheel switches to access its 40 channels stored in a plug-in EPROM module and, for repeater offset, a slide switch changed the memory address allowing recall of a second bank of data. Maximum output power of the IC-40 was about 1.5 watts using the standard BP3 battery pack and switchable to a low power range of around 100mW. For its time, and even rated against present standards, the little pioneer boasted an exceptionally sensitive receiver turning in figures around 0.2 µV (microvolts) for 12dB SINAD.

Technological development and changing market demands saw the evolution of the CPU-managed IC-40G with its LCD window, programmable receiver scan features and optional SELCAL, ranging up to the present time when the ultra-compact IC-40GX delivers an advanced package of features with the greatest finesse.

As a long-term observer and participant in the UHF CRS industry, it has always been apparent that, like most other technologies, the CRS transceiver design has been guided largely by novel values of the latest technical innovation and its immediate possibilities. In the past few years most of the realistic goals have been realised in terms of: miniaturisation, novel scanning features and performance. However, the fact of the matter remains that not everyone wants programmable SELCAL in their UHF CB hand-held... in fact, many users curse the operational complexity of the latest sophisticated models finding the host of keypad functions more confusing than anything else. Since most UHF CRS hand-helds are used in 'walkie-talkie' applications, features like simplicity of operation and ruggedness are held in high esteem by the majority of these users.

Icom Australia kept these principles uppermost in its thinking when it kept the original, simpler IC-40 in production for many years past its logical 'use by' date. Thus it is only recently that the old, IC-40 was phased out in preparation for the launch of the new IC-40S.

### Welcome to a new dimension

The new IC-40S is *not* 'just another UHF CB set'. It was plucked directly out of the Icom Commercial Radio lineup of portables and, after serious thought, its features were suitably modified to neatly fit the UHF CB public class radio profile.

The IC-40S is a compact handful of high-performance UHF transceiver wrapped in a super-tough shell of ebony black polycarbonate plastic and diecast metal alloy. It measures 140mm long by 57mm wide and 37mm thick, discounting projections, but including the standard 700mAh battery pack. The total weight is 372 grams including the screw-on antenna and the standard piggyback-mounted battery pack which alone accounts for the bulk of the weight at 198 grams.

The plastic case consists of a well-balanced, rounded moulding with no sharp projections and carries a textured surface that feels comfortable in the hand.

The inner surface of the case is metallised for added shielding and a tight, soft, neoprene gasket neatly seals the compartment against dust intrusion where the diecast sub-frame holding the bulk of the electronics mates securely with the recessed case shell surfaces.

The small, but adequate, 30mm diameter loudspeaker and its moulded grille occupies much of the upper one third of the fascia while the centrally-mounted, compact LCD window is recessed into the case for protection against knocks from the outside world.

The operational controls consist of: a left hand side mounted, rubberised PTT switch, a top-mounted combination rotary off/on switch and volume control and seven front panel-mounted, soft touch press buttons, several of which perform multiple functions.

Connections to the outside world consist of the usual pair of audio sockets to accommodate combination speaker/microphone, headset and other audio accessory access, however, on this occasion the 3.5mm phone jack also doubles as a computer interface to enter and read programming data.

Trickle charging the battery is accomplished via the now-familiar coaxial power socket recessed about midway down the right hand side of the case. Trickle charging times for the standard pack and the heavy duty packs are 10 hours and 15 hours respectively. The battery packs have metal contact terminals let into the case at the lower, rear edge to permit rapid charging in the desktop rapid charger.

The standard 9.6V, 700mAh BP-195 battery pack charges in about 1.5 hours while the heavy duty BP-196 (9.6V 1050mAh) takes about two hours to fully charge using Icom's BC-119 (also used for IC-40GX) charger plus an AD-81 adaptor. A multi 'six-spot' desk charger is also available as an option.

The antenna connector, I'm sad to say, is the one and only disappointment I had with the IC-40S. The socket is a custom coaxial fitting into which the supplied quarter wave 'floppy' is firmly mated. While this arrangement is satisfactory for normal hand-held use, a special adaptor is required to connect to an outside antenna system. As an Icom option the price of the adaptor is a bit painful.

## A feast of features...

As indicated earlier, the IC-40S does not offer SELCAL, the 5-tone selective calling system, nor is it even available as an option. If you need this facility you would be better to consider the excellent IC-40GX instead. However, if you want all the other features of the IC-40GX plus a few exciting new attractions the new model has it all. Have a look at these features:

All the UHF CB 40 channels... *plus* an extra 20 empty channels ready for programming in 25kHz steps anywhere between 450MHz and 480MHz.

Because of its highbrow heritage the IC-40S is licensable for commercial use within the above band segment, or for the addition of receive-only frequencies enabling the user to monitor individual custom spot frequencies. There may be some restrictions on the public domain programming software and at the time of writing the whole picture is not entirely clear, but you should be able to get the story from your Icom dealer by the time of publication.

CTCSS has been a standard feature in commercial two-way radio systems for many years. In fact, in Australia the feature is compulsory. CTCSS stands for Continuous Tone-Coded Squelch System, often referred to as sub-audible tone operation. Briefly, for readers unfamiliar with the CTCSS system, there is a series of 51 individual low frequency audio tones ranging from 67Hz to 254.1Hz that are used as a low level, background signal impressed on to the transmitted carrier wave; analogous to the background shading in a picture. The normal audio signal (modulation) is superimposed over the background signal forming a composite signal containing both audio modulating audio waveforms.

The matching receiver portion of the IC-40S transceiver continually screens all incoming signals searching for a match out of the 51 possible tones. If the feature is switched on at the time, only when the expected background audio frequency is recognised by the receiver will the mute be opened to pass the recovered audio through to the audio amplifier. All non-matches are rejected and the receiver muted condition is maintained. A MONITOR press button allows the user to bypass the CTCSS filtering at any time so that random channel activity may be observed. This function is also used to monitor for very weak signals.

There may be some argument about the number of CTCSS tones in the set. It is common to use a 38-tone set, however Icom uses a 51-tone set in this instance. The tone set includes all the standard frequencies but a handful of intermediate tones have been added.

The CTCSS functions are user-programmed by manipulation of the LOW and the MONITOR keys which also perform a number of other operations. To select the desired sub-tone, the LOW key is depressed for a second or two until a second beep indicates the program function is active. The key is then stepped until the LCD indicates 'Ct' at the left of the window accompanied by a multi digit number to the right. This number indicates the CTCSS tone by its frequency in Hertz. The desired frequency is selected via the UP/DOWN arrow keys immediately to the left of the LCD window. No points awarded for guessing the arrow keys also increment and decrement the channel number display which we will deal with a bit later. Press the LOW key for another short interval and the radio is restored to normal operation with the last displayed tone assigned to the displayed channel. Every channel may be assigned a different CTCSS tone. Under normal operation, the CTCSS function remains dormant until it is activated into one of its three modes via the MONITOR button.

To activate the CTCSS the press and hold routine is used again. The three sequential modes have corresponding tiny icons that appear along the lower edge of the LCD. Press and hold to display the 'T' for tone mode. This first mode will impress the selected CTCSS tone on to the transmitted carrier without affecting the open receiver function. This transmit-only encoding is useful for using some repeaters that require a tone for access. Press and hold again the monitor button to activate the receiver CTCSS filtering in the mute circuit, and only signals carrying the correct tone code will be admitted.

To use the CTCSS function as an alert for paging, simply repeat the press and hold process and a 'bell' icon will appear indicating the alert mode is active. The alert sounds a bit like a single burst of mobile phone ringer. In the paged radio the bell icon in the LCD window flashes until the call is answered which cancels the alert mode so that a new transmission does not reactivate the alert sequence. The whole function is returned to normal operation by one further press and hold sequence of the MONITOR button.

The LOW key toggles the transmitter between high and low power output as its standard function, but in the press and hold programming mode, it also accesses these other conditions listed below:

**Time-Out-Timer** which can be set to time out the transmitter after transmission times of 1, 2, 3 or 4 minutes. The ToT can also be cancelled.

**Power Saver** is toggled on or off.

**Confirmation beeps** to signify key entry activity are toggled on or off.

Transmit lockout can be set to three conditions:

1. Transmit always possible;
2. Transmit impossible when receiving a signal;
3. Transmission impossible when receiving a signal with unmatched CTCSS.

**Backlighting** of the display is controlled in four steps: five seconds delay, 10 seconds delay, permanently off and permanently on.

**Scan resume** sets the scan delay function through 5, 10 or 15 seconds after acquisition of a signal, or the search may be set to pause while a signal is present and then scan on five seconds after the signal is no longer available.

The **DUPlex** key also has a second function apart from setting the 30 channel (+750kHz) offset for repeater operation on the nominated channels 1 to 8. Keypad **LOCK** is toggled on or off as the secondary press and hold operation of the DUP button.

## Receiver channel scan

The Icom IC-40S has all the channel scanning functions that have come to be expected of modern UHF CRS transceivers. There is the usual OS (Open Scan) and GS (Group Scan) and a third group for priority scan. Setting active channels in any of the scan groups is simple.

After the desired group is selected via the O/G key, the current channel number will be displayed with or without an accompanying 'MR' icon. The presence of the icon indicates that the selected channel is active in the scan group while its absence means that channel is excluded.

To change the channel condition from active to inactive the SCN (SCaN) button is held pressed for a second or two until the icon either appears or disappears. Just press SCN briefly to set the selected scan group in motion.

## Channel selection

Channel selection is via the UP or DOWN arrow keys and is worth a special mention in the case of the IC-40S.

The selector operates in the expected manner. One channel step per press of the key, or by pressing and holding either up or down keys a continuous stepping motion is set in progress. However, when channel 1 is reached — from either direction — the stepping sequence is halted. The transceiver holds on the default channel 1.

This make a very handy reference for poorly-sighted persons, or for whatever reason the user is unable to see the display. Single steps are announced by one beeping sound per step in either

....☞

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ICOM
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direction. When the confirmation 'beep' mode is active a double 'beep' is sounded whenever the end/starting point channel (1) is reached. When the beeps are disabled, channel 1 still becomes the start or end point but no sound is evident.

## Performance

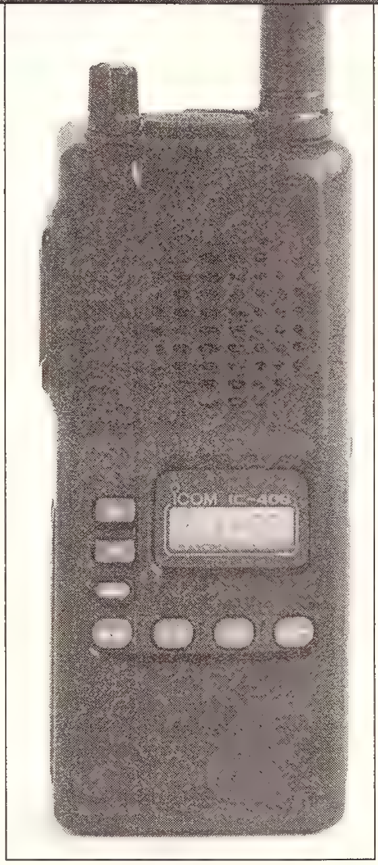
There is no doubt the IC-40S is a flawless performer. It is to be expected, I suppose, due to its commercial specification pedigree.

### The receiver...

Looking at the receiver first, we find the sensitivity just nudging on 0.17μV for the traditional 12dB SINAD reference... which is pretty good by commercial let alone UHF CRS standards. Icom claims better than 0.25μV. The measured squelch/mute threshold was 0.16μV, but signals can be discerned well below this limit by using the monitor switch to disable the mute gate.

A tiny bargraph along the very lower edge of the display window indicates relative received signal strength in familiar S-meter terms with calibration values of '5' midway along the scale and '9' towards the upper limit, but these values are not to be taken seriously. The bargraph is divided into five segments which respond to input signal levels in the following way:

| **Segment** | **Strength** |
|---|---|
| **1** | 0.50μV |
| **2** | 0.75μV |
| **3** | 0.95μV |
| **4** | 1.40μV |
| **5** | 2.15μV |



We usually don't attempt to analyse receiver desensitisation and overload characteristics from extraneous signals in CB reviews because it is generally accepted that CB equipment performance is inferior when compared with their much higher-priced commercial counterparts.

Unfortunately, receiver sensitivity is held in great esteem by many and is often touted as the most desirable characteristic. High sensitivity is not much of a benchmark, however, unless all other external influences are held in their proper perspective. For example, if an unrelated signal on some other frequency — perhaps many MHz away — causes the target signal to be interfered with or even overpowered, out goes the baby with the bath water.

The usual way we try to collectively quantify this interference/overload effect on a UHF CRS transceiver is by taking it to an area that is renowned for its RF pollution and consequent detrimental effects on the CRS. While this is not a definitive laboratory technique, it is often much more informative than the more scientific route!

The inner city limits of Melbourne and some of its suburbs are notorious for wiping out UHF CRS receivers and scanners, often replacing the desired signals with Police transmissions and other commercial users signals across all 40 channels. And, over the years — especially since the introduction of cellular phones — we have discovered a few of the worst (best) spots around town guaranteed to scare the name badge off a few portable and mobile rigs!

Yep, you guessed it. Almost undaunted by the challenge, the IC-40S was hardly affected in any noticeable way from the user's point of view. We observed the odd 'blip' and small amounts of desensitisation, however the overall performance was brilliant. If you add the safeguard of CTCSS operation into the equation the IC-40S presents a pretty fancy little 'go anywhere' receiver package that is almost completely immune to RF interference under severe conditions.

Recovered audio from the small internal loud speaker is quite adequate — better than most — but can be improved by the use of an external speaker... sort of defeats the purpose but... Current requirement for the receiver is about 60mA for standby operation, about 250mA at maximum audio output (about 500mW) with a dramatic decrease in demand, down to 13mA, for battery saver mode.

### The transmitter...

The transmitter produced its rated five watts of output power on a fully charged battery and about 700mW on the low power range. Variable reactance frequency modulation is used with measured peak deviation just under 5kHz for loud speech input. The transmitted audio is well rounded and full bodied with plenty of mid-range where intelligibility is best.

Transmitted CTCSS deviation level was set at about 850Hz for the highest frequency tone of 254.1Hz and varied a little through the range down to 800Hz deviation for the lowest tone of 67Hz.

On high power transmit, the current drain is about 1.6 amps falling to 700mA for the low power range.

## Accessories

In the past, Icom accessories have tended to be top quality but a bit on the expensive side. Not any more... with one exception!

Check these recommended prices for a few of the desirable options. Prices are inclusive of Sales Tax:

| | |
|---|---|
| Spare 700mAh battery | $74.56 |
| H/duty 1050mAh battery | $97.86 |
| Battery case 8 x AA cells | $18.64 |
| Programming software | $37.28 |
| Programming lead assembly | $60.58 |
| Desk top charger | $116.50 |
| BNC-J converter antenna socket adaptor | $55.92 |

(for a small connector, all I can say is ouch!)

## Summary

Icom has put together the best little package in UHF consumer radio to ever hit the Australian market — provided you don't require 5-tone SELCAL as a standard feature.

The IC-40S is also excellent value, priced at under $500 for the complete package including transceiver, 700mAh battery pack, antenna and wall pack charger.

Rounded, compact polycarbonate mouldings with diecast metal frame combine with dust-proof construction to produce a very rugged, reliable product that will stand up to the most severe operating conditions — just like the Icom full commercial-grade series transceivers.

The receiver characteristics are excellent and the unit performs exceptionally well under attack from various sources of high-level RF pollution.

The package is especially attractive to a user with the requirement for out-of-band monitoring or the need for a commercial channel within the 450 to 480MHz region... fully stamped and approved for commercial use for under $500.

Highly recommended...

Icom has brought a maturity to UHF CRS hand-held transceivers that will carry it well into the 21st Century.

R&C thanks Icom Australia for the loan of the review transceiver.

# Who's connected to the Internet?

By Thomas R Sundstrom, W2XQ

The paradigm of the Internet is that many computers are connected to many other computers through an amorphous collection of networks crossing the globe. As much as e-mail, 'chat' programs and Internet telephony programs facilitate communications between users, the Internet user is still insulated from other users elsewhere.

We send e-mail, but we do not know when the other person will read that mail. We log into an Internet Relay Chat 'room' and see others logged into that room, but a person we want to 'chat' with may be logged into another 'room' unknown to us. Internet telephony requires that two users coordinate a schedule — probably by e-mail — to meet for a conversation.

Further, we may be connected to the Internet dealing with e-mail and a person we want to contact may be browsing Web pages. What is missing? It is the person-to-person communications. How do we know if our friends or business contacts are online? We need a feedback tool that tells us that another person is online... no matter what that person may be doing while connected to the Internet. A solution to these questions produces immediate gratification.

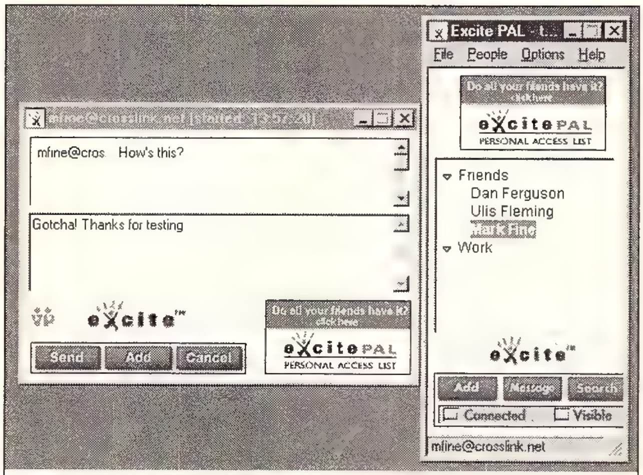
Think for a moment how such instant communications may help you in the radio hobbies. As a listener to the shortwave or VHF/UHF bands, you find something interesting. You can immediately notify other 'friends' of the station or activity you found. Radio amateurs can use the software for DX spotting networks, away from the cluttered frequencies of packet radio and without broadcasting the frequency to all who may listening to two metres FM.

## The solution

There is a relatively new class of software that fulfils the missing person-to-person communications. We have not seen a name that describes such software, but perhaps the term 'notification' software is as good as any.

The concept is simple. Whenever you and each friend or business contact connect to the Internet, each person's computer automatically starts a small program that runs in the background. Everyone specifies a list of 'friends' — it need not be the same list — and the program lets you know when a 'friend' is connected to the Internet. It does so by changing an icon or the colour of the name.

Three Windows 95 applications are now available, and some other operating system platforms are supported as well. We look at freeware software solutions from Excite, ichat inc, and Mirabilis Ltd. Note that all 'friends' must be using the same 'notification' software application.



mfine@cros How's this?

Gotcha! Thanks for testing

mfine@crosslink.net

*The easy to use PAL interface identifies friends on line by changing the name to green, and a two-part chat window separates the incoming and outgoing typing.*

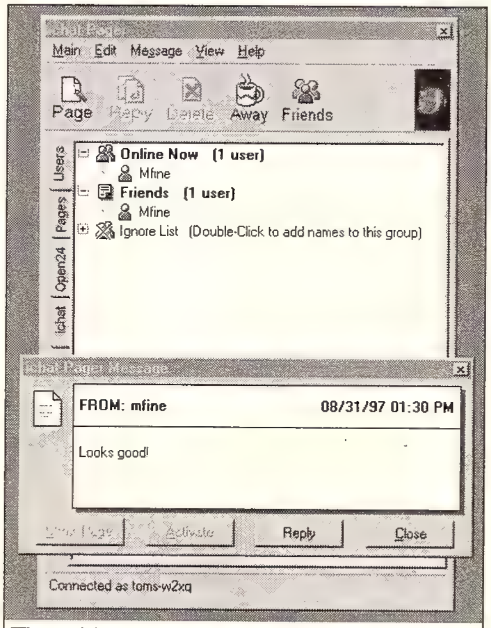
## eXcite PAL

- URL: www.excite.com
- Versions: Windows 95, Windows 3.1, Mac PowerPC, other Mac
- Win 95 file sizes: download 539k, installed 1127k[1]
- Win 95 memory required: 2032k[2]

If you use Internet search engines, no doubt you have used 'eXcite' at one time or another. PAL is an 'instant messaging service' that will eventually carry advertising in the small window atop the main screen. The button to download PAL is at the bottom of the screen. Upon downloading PAL, you will receive an e-mail registration message that must be responded to within 48 hours. If no reply is sent, the registration will be cancelled.

PAL has the smallest memory footprint of the three applications, an important consideration if the PC has a small of RAM or a small hard disk. The addition of users to the list requires entering an e-mail address or a lookup of users through the PAL directory. Users may be sorted into groups; the default is friends and work. Since there is a directory, we have not found a way to selectively control those users that may see our presence online. It is limited to all or to a group.

Unfortunately for dial-up users PAL is annoying when off-line. PAL continuously prompts for a connection to the 'net and pops up our Winsock dialogue box. We could not test for similar behaviour in other versions.



FROM: mfine 08/31/97 01:30 PM

Looks good!

Connected as toms-w2xq

*The tabbed ichat interface requires that you select the first tab to see who is on line, the second to see any pager messages.*

## ichat, inc Pager

- URL: http://www.ichat.com
- Versions: Windows 95, Mac PowerPC, Mac 68K
- Win 95 file sizes: download 2694k, installed 1268k
- Win 95 memory required: 5038k

ichat's core business is selling chat server software. Akin to the Internet Relay Chat, ichat's offering is more structured than IRC. Pager is a logical extension of the chat software business that tells all that a user is online — but not necessarily in a chat room. The 'Open24' tab is the gateway to the topical chats on ichat servers.

When you register to download Pager, you are asked a few optional questions that describe your hobbies and likes. The profile information is used to receive 'netpages' about ongoing discussions, chat rooms and forums that interest you. You can restrict access to your profile information, yet remain searchable by name and email address. Further, to control interruptions, you can allow pages only from your 'friends' list.

Pager has more features than PAL. In addition to instant messaging and real-time chat, you can add to your personal 'friends' list to determine when they are online. Multiple persons from your list may be invited into a RoundTable, private chat room.

File transfer is easy. Simply drag any file onto a name in the 'friends' list. If the recipient has the RealMedia™ play, Pager will automatically launch the RealPlayer™.

## Mirabilis Ltd ICQ

- URL: http://www.mirabilis.inter.net/
- Versions: Windows 95, Windows NT 4.0, Windows 3.1, Macintosh (in development)

- Win 95 file sizes: download 1397k, installed 1519k
- Win 95 memory required: 5944k

Mirabilis was founded in July 1996, which makes it the elder statesman of this class of software. Despite its short life of less than 18 months, the maturity of this product is quite evident. At first glance it moves listed users from 'offline' to 'online' to let you know of friends and contacts connected to the Internet. Right-click on a name, and you will find a host of additional capabilities.

The Personal Contact List is a defined list of other ICQ users you want on your contact list. If they are on-line, their status is displayed.

Your status availability may be set as Online, Away, Do Not Disturb, Privacy (Invisible) and Off-line. Your status, except privacy (invisible), is shown on the contact list of any other ICQ user online. You may customise the default messages for 'away' and 'do not disturb' statuses.

The file transfer module supports crash recovery, batch transfer, entire directory transfer and more.

There is built-in conference chat (both IRC and split-screen styles) supporting an unlimited number of users.

Online, you may send your message to one or multiple users, forward messages and reply. If the receiving user is offline, there is a store-and-forward option to automatically deliver the message when the user logs in. Offline, you may compose your messages and auto-send them later when you are connected to the 'net.

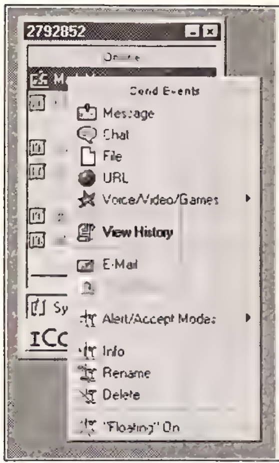
There is collaborative browsing that invites recipients to join the sender to go to a specific URL. The user can receive URLs that will launch their Microsoft or Netscape browser and auto-go directly to the incoming URL.

ICQ maintains a history record of all incoming and outgoing messages and URLs are automatically saved. Incoming and outgoing messages are saved in separate folders. Dialogues can be retrieved in a threaded form. Chat messages can be saved as a text file at the end of the chat.

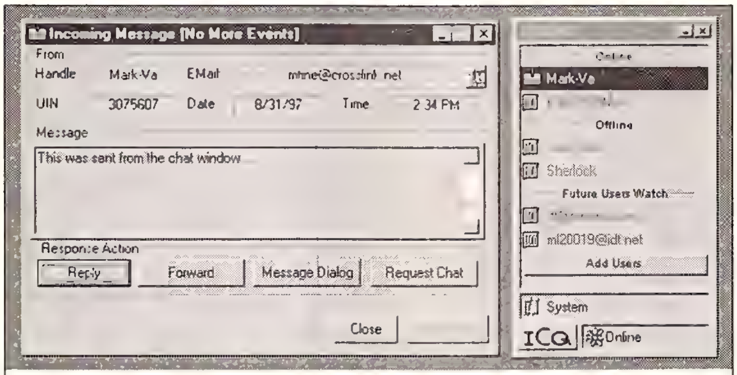
Alerts, accepts, permissions and privileges are set by the user. You can optionally require that users get authorisation from you before being added to other contact lists. Other customisation goes down to the individual level. For example, the user can choose to be in 'away' status, globally or towards specific users. In this mode other users trying to send him a message will be alerted of his status. The user can also define that whenever his computer's screen saver is on he will be seen as in the 'away' mode.

## So which one is best?

Our perspective is that **Excite PAL** is the newest of the bunch and the least mature application of the three.

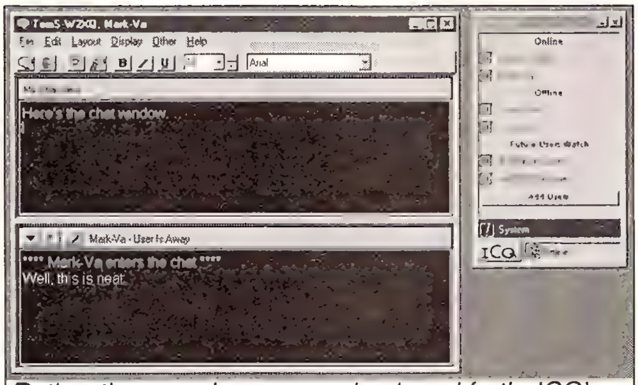


*The right click of the mouse has a lot of functionality in ICQ which is otherwise hidden from a seemingly simple user interface. These are the options displayed when clicking on a online user's name.*



Handle Mark-Va EMail mfine@crosslink.net
UIN 3075607 Date 8/31/97 Time 2:34 PM
Message
This was sent from the chat window

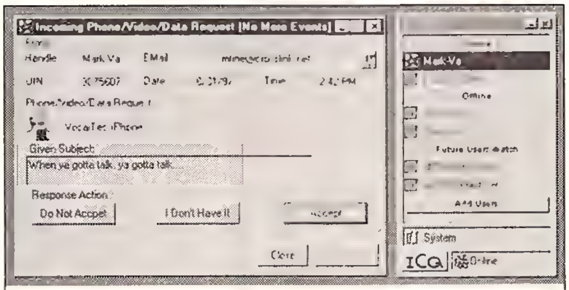
*The main ICQ screen with, to the left, the message box which opens when responding to an incoming message.*



Here's the chat window.

**** Mark-Va enters the chat ****
Well, this is neat.

*Rather than send messages back and forth, ICQ's chat window facilitates a 'conversation'. Both users can type simultaneously.*



Handle Mark-Va EMail mfine@crosslink.net
UIN 3075607 Date 8/31/97 Time 2:42 PM
Given Subject
When ya gotta talk, ya gotta talk...

*ICQ will launch 14 different video and voice apps — with permission, of course. In this instance, clicking on 'Accept' will automatically launch our Internet Phone application and make the telephony connection.*

However, there are mitigating factors that may be important. Versions are available for most popular operating systems and it takes up the least amount of system resources to run.

**ichat Pager** seems to be a good compromise between PAL and ICQ. For a no-nonsense alert system not requiring all the capabilities of ICQ, Pager works well. The capability to sort users into groups is not found in ICQ, and groups can be activated or deactivated as a whole.

**ICQ**, however, is the 'king of the hill' in this category of software. In the second half of August, new users were signing up at a rate of more than 20,000 per day. The assigned 'User Identification Number' surged past three million on August 31. Though group control a group of users is not available, the security and alert options are extensive. Its capability to integrate and launch other desktop applications, e-mail, browser, audio and video with a right click of the mouse is a handy, integrating feature. ICQ is 'smart' — it goes to sleep when you are offline and activates only after a network connection is detected.

At one point during our testing[3], we ran all three applications simultaneously. All three performed flawlessly, but this tester had trouble keeping track of which application was active. Sound effects can be customised in ICQ, and the flashing taskbar label or desktop tray icon helped to identify the activated program.

Our choice? ICQ, clearly. But all of this software is free and your needs are different. Are you sceptical as to the usefulness of this type of software? We recommend you download one or more of the applications and evaluate them for yourself. Hook up a few friends or associates, and you'll probably wonder how you did without for so long a period of time.

## References

[1] The amount of disk space will vary somewhat, depending upon the size of the hard disk and its clusters. A larger hard disk has larger-sized clusters, and smaller applications will 'waste' disk space by not filling each cluster to its capacity.

[2] The total memory required by the application when running, some of which is spooled to the hard disk swap file. The value will vary somewhat depending upon the size of the hard disk and its clusters.

[3] Thanks to *Mark Fine* of Fineware, in Virginia, USA, for helping us with the testing of the software. Mark is the author of 'Smart R8 Control', Drake R8 receiver control software that additionally includes current English language international broadcast schedule data. Check out the details and other software products at his Web site. The URL is **http://www.crosslink.net/~mfine/**.

# IN FLIGHT INFO

**By Bill Petersen,**
**C/- Radio & Comms,**
**PO Box 119,**
**Oakleigh, Vic 3166**

Welcome to the column, which I have inherited from Bob Bell, who has left R&C magazine to concentrate on other aspects of his life. Best wishes Bob, and I wish you well in the future.

*(Yes, thanks very much for your efforts over the past few years Bob. We were sorry to see you go, and thank you for finding such an ably-qualified replacement for us. Ed.)*

To kick off, a tale of three-times Formula One world motor racing champion Jackie Stewart, recently trapped in Jamaica during Hurricane Hugo. Jackie Stewart is often referred to as 'King Lear', as he constantly charters and uses Learjets to commute internationally, particularly around Europe.

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- Wind Chill
- Alarms
- Highs & Lows
- Instant Metric Conversions
- Outside Humidity & Dew Point Option
- Rainfall Option
- Optional PC Interface

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(94 Beaconsfield Road)
Ph: 0359 684863 Fax: 0359 685810

Jackie had been in Kingston, Jamaica for a business meeting with senior executives from a well-known international tyre company. Suddenly, 'King Lear' realised that a hurricane warning was being issued and it was due to hit Jamaica within the hour. And hit it did, with great ferocity. Jackie decided he wanted to be anywhere but Kingston and, as luck had it, he just happened to run into a Japanese man who happened to be doing, shall we say, a little 'diplomatic business' in Kingston.

All communications had been cut when the hurricane had struck, but this little Japanese man had his own satellite telephone. Jackie 'King Lear' Stewart cut a deal with the guy... "You let me use your phone to arrange an executive Learjet to get me out of here, and you can have a free seat out in the aircraft." Done! And that's how it happened. Jackie found that a TV news crew was flying in a Lear to Kingston to cover the effects of the hurricane. Jackie took the aeroplane over, after ringing out on the Japanese diplomat's satellite phone, and cementing the deal.

With the Japanese connection on board, the Learjet was flown out to Miami. Stewart and his new-found pal were the first persons to get out in the wake of the devastating hurricane.

Remember the British Airways Mt Galangung near disaster from volcanic ash being spewed high into the heavens from that very active and volatile mountain? The British B.747 engines ingested volcanic ash in the atmosphere, and all four engines stopped and had to be re-lit. The aeroplane was for a time a massive glider, and the crew did an excellent job of managing the situation and finally making an emergency landing, albeit with badly damaged engine interiors.

These days, airlines operating into the Orient are members of the Orient Airlines Association, or OAA. As this article is published and read by you, the name of this

*Motor racing ace Jackie Stewart, seen here at the height of his career. These days, he's better known around the airline traps as 'King Lear'!*

organisation is being changed to **Association of Asia Pacific Airlines**, but at time of writing it is still OAA. Membership currently consists of Air New Zealand, Air Nuigini, All Nippon Airways, Ansett Australia, Asiana Airlines, Cathay Pacific Airways, China Airlines, Eva Air, Garuda Indonesia, Japan Airlines, Korean Air, Malaysian Airlines, Philippine Airlines, Qantas Airways, Royal Brunei Airlines, Singapore Airlines, and Thai Airways International. There are some other airlines flying into the region which are not members of OAA.

These airlines have formed an allegiance to beat the 'Pacific Ring of Fire', which is described as the "...greatest concentration and widest spread of active volcanoes from Japan to Papua New Guinea. A quick and reliable exchange of information regarding the volcanic activity is essential in preventing aircraft being caught in huge airborne volcanic ash and dust clouds. Laid down procedures are now in place if any member airline of OAA has one of it's aircraft sight volcanic activity from the flight deck..."

Other member airlines plus Air Traffic Control are quickly alerted of the activity and the information is speedily disseminated.

Back in 1995, an international conference was held in Darwin relating to the hazards of volcanic ash to aviation. Qantas Airways' Flight Operations Dispatch Department subsequently set up a relationship with the Volcanic Ash Advisory Centre which had just been set up by the World Meteorological Office, and ICAO (International Civil Aviation Authority).

Qantas OPs Dispatch is constantly now in communication with Volcanic Ash Advisory centres in Darwin, Tokyo and Wellington, monitoring activity and passing on significant information for airline pilots flying in the 'Pacific Circle of Fire'.

David Carroll from Bathurst NSW is very interested in the flurry of radio activity in his home city for the Bathurst 1000 motor race. David arms himself with several scanners in order to make sure he captures all the action from the races. And David, being an aviation buff first and foremost, was also closely monitoring the aviation bands on the arrival of the RAAF Roulettes.

Dave lives just five minutes drive from Mount Panorama where the race is run, and wrote to Bob to advise that the Roulettes are still using 133.9 MHz as their primary display air-to-air frequency. Given Dave's proximity to 'the Mount', they were virtually performing immediately above his house. It must have been a great day's monitoring all round, David. David also provided us with a stack of radio frequencies relating to race control and television coverage, which we have passed on to Russell for the scanning column.

Richard Jones, General Manager of the Hunter Region Helicopter Rescue Service, spoke to Bob to advise that in order to keep flying, as part of the merchandising program run by his organisation to raise funds, there are numerous items that may be of interest to readers of this column. 'Angel II' key rings ($6), child t-shirts size 4-12 ($15), adult t-shirt size 14-XXL ($25), cord baseball cap ($12), beer/soft drink holder ($3), limited edition helicopter pin ($10), and Angel Billy rescue bear ($24.95). Postage and handling is $2 extra. Bankcard, Mastercard and Visa is available.

Simply write to The Hunter's Westpac Rescue Helicopter Service, PO Box 230, New Lambton, NSW 2305. You can phone the service on (02) 4957 2299, or fax on (02) 4952 8263.

As I live in the region, I frequently monitor 'Westpac One' (the radio callsign of the Bell 412 helicopter named 'Angel II') as it departs its base for the John Hunter Hospital in Newcastle on frequency 125.7 MHz, Sydney Flight Service. The frequency is re-broadcast on 125.8 which is easier to receive in the Sydney Metropolitan Area than 125.7 MHz.

The Hunter Westpac Rescue Helicopter Service is very interested in hearing feedback stories about people they have rescued and carried in the helicopters they have operated. If you are one of the lucky people who have been helped by the service, or have a friend or relative who has been conveyed by the 'Angel' service, write or ring them, and let them know how the patient is getting on. The team is genuinely interested in the progress of the patients they manage to save. Address these letters or calls to Richard Jones, General Manager.

I was part of the crowd watching the 1997 Abbotsford International Airshow in British Columbia, Canada. I was monitoring tower frequencies 119.4, 121.0, and 295.0 (UHF), along with ground 121.8, and the ATIS on 119.8.

Canadian Airlines had a B.747 fly-past, and there were MIG-15s, barnstorming, and powered parachutes. On a military theme, actually flying, there were F-15 Eagles, CF-18s, a couple of A-10s, F-16s, B-1B bombers, F-4 Phantoms, C-130 Hercules, and a T-33. There was also a large static display with KC-10, B-1B bombers, KC-130s, S-3 Vikings, a Canada Coastguard Twin Otter, a C-21, E-2C, C-5 Galaxy, and a U-2 spy plane, which arrived on the Friday during the airshow. In addition, the static displays included an A-10 Thunderbolt, t-33, F-18, F-16, KC-135, KC-141 Starlifter, Twin Huey, an F-4 Phantom, C-9 Nightingale, F-15E Eagle, two German Tornados, a T-34, T-38, the wonderful A-4 Skyhawk, and an Avro Arrow replica!

The highlight of the display was the precision flying demonstration by the Canadian Forces 'Snowbirds', from 431 Air Demonstration Squadron, led by Major Darryl Shyiak, flying Canadian Ct-114 Tutor jet trainers. The aircraft are powered by General Electric 85-CAN-40 Axial Flow turbo jet engines, and they double as both airshow and transport aircraft, carrying all team members and equipment to airshow sites.

Hope you enjoy my version of the column, and I'll look forward to seeing you here next month.

ICOM Clearly Ahead

**"VK3LZ calling!"**

More sound information from your friends at Icom.

OUR NEW FLAGSHIP ARRIVES!

What a great way to kick off the new year. Icom's new IC-746 delivers 100W on HF, 6m, & 2m at a much lower cost than its predecessor, the IC-756. This is the perfect shack unit to compliment the IC-706 MKII mobile. Be sure to see our new flagship at your nearest authorised Icom dealer.

NEW HAND-HELD TRIBAND COMING SOON.

The goodies keep coming! Watch out for Icom's new IC-T8A Triband transceiver (2m, 6m,70cm). If you liked the IC-T7A or the IC-Delta 1A then you will love this new unit and its price!

WYONG HAMFEST COMING UP SOON.

Always a well attended event, the Wyong Hamfest promises to be a must-see in '98, It's on again in late February, final date to be confirmed so watch this column.

*"...73"*

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# Baudwalking

**Happy New Year to all, even if it is a few days early! Summer's here and more time is spent outdoors, but when you come inside to escape the sun we have a variety of items for you to look at. We have amateur radio and satellite tracking information, the BBC has been busy with a news service and RealAudio, and more. Read on!**

## Errata: BeaconClock

John Bird, VK3BCQ, informs us of a problem with the URL for the BeaconClock software reviewed in the November 'Baudwalking' column. The correct URL is **http://www.mutadv.com/kawin/pages/bcnclk.htm** (the '.htm' was missing).

Thanks, John, for the heads up.

## Amateur Radio pages...

David Simpson, VK3NDS, has significantly upgraded his amateur radio pages since we last visited them. Links are divided into more than a half-dozen groupings that include digital, DX, equipment manufacturers, home pages of radio amateurs in Australia and elsewhere, shortcuts to all of the rec.radio newsgroups, propagation, satellite and shortwave listening. Most entries include a few words of explanation.

Of all his entries, David selects one as his 'site of the month'. Many active amateurs know of the huge OH2BUA 'Webcluster' page with DX callouts, but VK3NDS also has a link to a somewhat similar site in Japan. David has a nicely done site, but it requires Java and JavaScript capabilities to fully appreciate all that's been done in upgrading these pages. Grab a late version of the Netscape (preferred) or Microsoft browser if necessary, then check into **http://www.tbsa.com.au/~dsimp/** and drop a 'hello' into the guestbook.

## ARRL Letter in audio form

Last month we told you of the weekly ARRL Letter being available at the URL http://www.arrl.org/arrlletter/. Now the *audio* version, using RealAudio 3.0 for a 28.8k connection, can be heard at **http://www.arrl.org/arrlletter/audio/**. The downside is that only the highlights of the newsletter are included, and only two weeks — the current and previous week — of Letter highlights are maintained on the page.

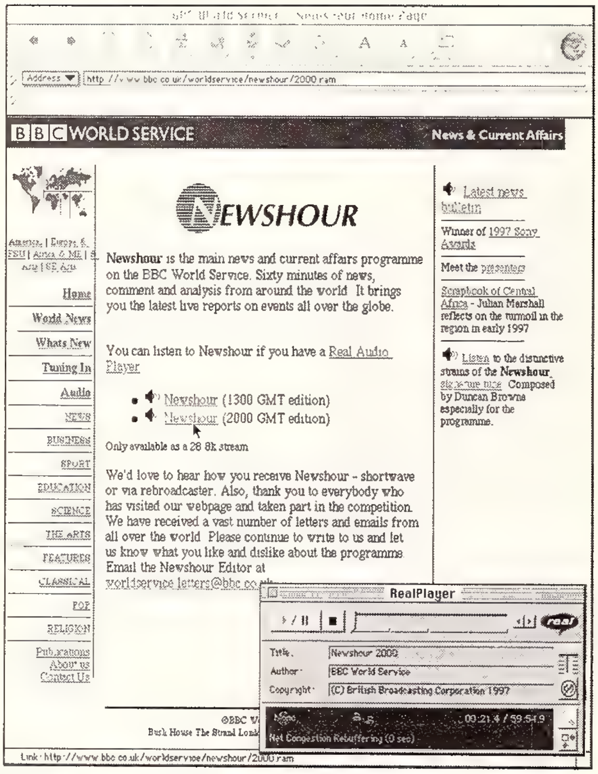
## Spanish medium wave

Want to practice your Spanish? Are you interested in medium wave DXing? Juan Antonio Arranz has posted a Spanish language page that includes some history, lists of stations, and interfering stations... and images of pennants and station logos. Take a look at **http://www.teleline.es/personal/jas84756/**

## BBC WS Newshour

The BBC Newshour is the main news and current affairs program on the BBC World Service. The 60-minute program airs twice a day, at 13 and 20 UT. Now the BBC has installed an on-demand streaming audio page that offers both broadcasts and the latest news bulletin in 28.8k RealAudio format. There are links to other news pages on the BBC servers as well. Tune into **http://www.bbc.co.uk/worldservice/newshour/**.

Additionally, the BBC opened a new online news service last November. The intention, apparently, is to compete with CNN and ABC News. BBC News Online may be read at **http://news.bbc.co.uk/**. There is a five-minute on-demand RealAudio BBC summary (heard at the top of most hours on the World Service frequencies) available on the 'Front Page'.



Newshour is the main news and current affairs programme on the BBC World Service. Sixty minutes of news, comment and analysis from around the world. It brings you the latest live reports on events all over the globe.

You can listen to Newshour if you have a Real Audio Player

- Newshour (1300 GMT edition)
- Newshour (2000 GMT edition)

Only available as a 28.8k stream

We'd love to hear how you receive Newshour - shortwave or via rebroadcaster. Also, thank you to everybody who has visited our webpage and taken part in the competition. We have received a vast number of letters and emails from all over the world. Please continue to write to us and let us know what you like and dislike about the programme. Email the Newshour Editor at worldservice.letters@bbc.co.uk

Latest news bulletin

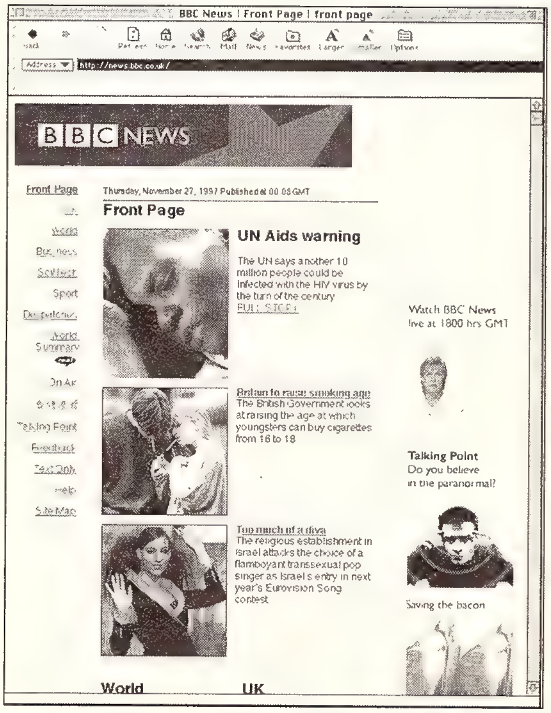
Winner of 1997 Sony Awards

Meet the presenters

Scrapbook of Central Africa - Julian Marshall reflects on the turmoil in the region in early 1997

Listen to the distinctive strains of the **Newshour** signature tune. Composed by Duncan Browne especially for the programme.

Title: Newshour 2000
Author: BBC World Service
Copyright: (C) British Broadcasting Corporation 1997



Thursday, November 27, 1997 Published at 00:05 GMT

Front Page

UN Aids warning

The UN says another 10 million people could be infected with the HIV virus by the turn of the century

FULL STORY

Britain to raise smoking age

The British Government looks at raising the age at which youngsters can buy cigarettes from 16 to 18

Too much of a diva

The religious establishment in Israel attacks the choice of a flamboyant transsexual pop singer as Israel's entry in next year's Eurovision Song contest

Watch BBC News live at 1800 hrs GMT

Talking Point
Do you believe in the paranormal?

Saving the bacon

## Sunrise, Sunset, Moonrise, Moonset...

Are you active on the VHF and UHF bands doing moon bounce (EME) work? Chase DX at twilight? The Astronomical Applications department of the US Naval Observatory has a data page with two items of interest:

- Complete Sun and Moon Data for One Day
- Table of sunrise/sunset, moonrise/moonset, or twilight times for an entire year

You will need a forms-capable browser to access the information. Dial into **http://aa.usno.navy.mil/AA/data/** and have a look.

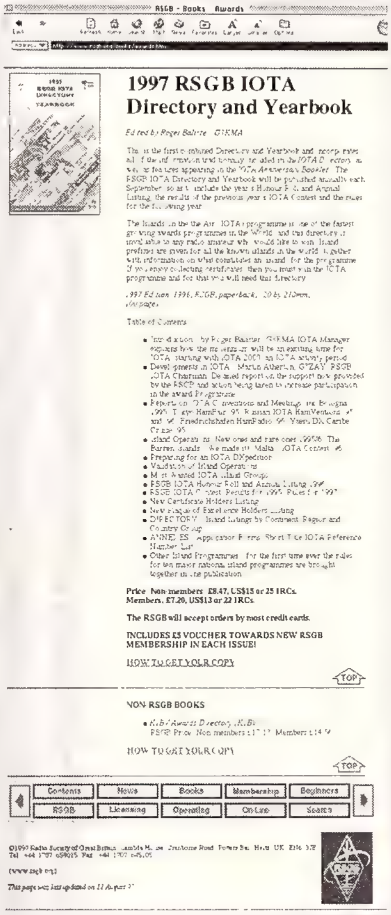
## HF Propagation Charts

Those radio amateurs who have seen the ARRL's QST publication have undoubtedly looked at the "Shortwave Radio Propagation Predictions" prepared by ARRL

## Islands on the Air, and *lots* more...

While nosing around David Simpson's pages at http://www.tbsa.com.au/~dsimp/ we found a pointer to several IOTA (Islands on the Air) Web sites, including 'Islands on the Web' authored by Chris Taron, N1HRW. Taron writes "...The mission of this website is to provide amateur radio operators interested in the Radio Society of Great Britain's Islands on the Air Program (IOTA) with the tools and information needed to pursue this challenging program...

"So what *is* the Islands on the Air (IOTA) program? The IOTA program is managed by the Radio Society of Great Britain (RSGB) and is enjoyed by an ever-growing number of amateur radio operators world-wide. To learn more about the IOTA program and how to take part in it, the RSGB maintains a useful website outlining the rules and goals of the IOTA program. I suggest you visit this site to learn about the program, then return here and we'll point you towards the DX!"



### 1997 RSGB IOTA Directory and Yearbook

*Edited by Roger Balister G3KMA*

This is the first combined Directory and Yearbook and incorporates all of the information traditionally included in the *IOTA Directory* as well as features appearing in the *IOTA Anniversary Booklet*. The RSGB IOTA Directory and Yearbook will be published annually each September so as to include the year's Honour Roll and Annual Listing, the results of the previous year's IOTA Contest and the rules for the following year.

The Islands on the Air (IOTA) programme is one of the fastest growing awards programmes in the World, and this directory is invaluable to any radio amateur who would like to win. Island prefixes are given for all the known islands in the world together with information on what constitutes an island for the programme. If you enjoy collecting certificates then you must win the IOTA programme and for that you will need this directory.

*1997 Edition 1996, RSGB, paperback, 20 by 210mm, 160 pages*

Table of Contents

- Introduction by Roger Balister G3KMA IOTA Manager explains how the millennium will be an exciting time for IOTA starting with IOTA 2000 an IOTA activity period
- Developments in IOTA Martin Atherton, G3ZAY RSGB IOTA Chairman. Detailed report on the support now provided by the RSGB and action being taken to increase participation in the award Programme
- Reports on IOTA Conventions and Meetings inc Bologna 1995, Tokyo HamFair 95, Russian IOTA HamVentures 95 and 96, Friedrichshafen HamRadio 96, Ytem DX Caribe Cruise 95
- Island Operations New ones and rare ones 1995/6. The Barren Islands. We made it! Malta IOTA Contest 96
- Preparing for an IOTA DXpedition
- Validation of Island Operations
- Most Wanted IOTA Island Groups
- RSGB IOTA Honour Roll and Annual Listing 1996
- RSGB IOTA Contest Results for 1995 Rules for 1997
- New Certificate Holders Listing
- New Plaque of Excellence Holders Listing
- DIRECTORY Island Listings by Continent, Region and Country Group
- ANNEXES Application Forms, Short Title IOTA Reference Number List
- Other Island Programmes for the first time ever the rules for ten major national island programmes are brought together in one publication

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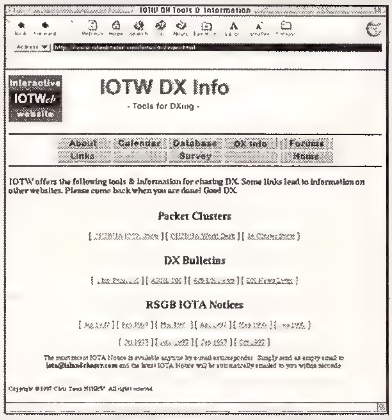
*This page was last updated on 11 August 97*



IOTW DX Info

- Tools for DXing -

IOTW offers the following tools & information for chasing DX. Some links lead to information on other websites. Please come back when you are done! Good DX.

**Packet Clusters**

**DX Bulletins**

**RSGB IOTA Notices**

The most recent IOTA Notice is available anytime by e-mail autoresponder. Simply send an empty email to iota@islandchaser.com and the latest IOTA Notice will be automatically emailed to you within seconds.

Copyright ©1997 Chris Taron N1HRW. All rights reserved.

Taron's interactive Web pages now include:

- Forums — IOTW offers three web-based forums for passing IOTA information;
- IOTA Calendar — IOTW maintains a calendar of all upcoming IOTA DXpeditions;
- Most Wanted Islands Survey — IOTW offers a web-based form for IOTA chasers to fill out to rank the most wanted islands in the world;
- Links — IOTW offers a long list of amateur radio links and a page for links added by users.

And he plans to add 'DX Tools' including:

- Instant greyline image of the world;
- WWV spots from packet radio;
- Beam headings from your QTH to any IOTA in the world;
- IOTA spots from packet radio;
- Articles — IOTW will offer stories from various DXpeditions, and interesting articles concerning our hobby;
- Databases — IOTW will maintain online databases including:

— A searchable IOTA QSL database

— A searchable expedition database showing dates and information of past IOTA expeditions; and

— A searchable "Who's Who" database of IOTA chasers and their addresses; and

- Logs — IOTW will offer a 'Logs Online' service for DXpeditions to place their logs on the internet during or after the expedition for users to search to verify their QSOs.

Islands on the Web's URL is **http://islandchaser.com/**. The RSGB IOTA pages start at **http://www.rsgb.org/operate/iota/iota.htm**.

staff. For many years Jerry Hall, K1TD, was an Associate Technical Editor for QST, before retiring in 1992. Hall still assists in preparing these propagation charts... and now you can find a variant on his Web site. It is nicely done. Given a world map, select two points and a monthly chart is displayed. Three traces are shown. "A red broken line shows the lowest useable frequency (LUF)... The green curve shows the 50% maximum useable frequency (MUF), meaning that the MUF will probably be at least this high on half the days of the month. The brown curve shows the 10% highest possible frequency (HPF) — on 10% of the days of the month the MUF will probably be at least this high." Plug into **http://home.att.net/~jerhall/** and have a look.

### National Anthems

I have not figured the "why" yet — I do not see a radio connection or other explanation — but Geir Onstad of Oslo, Norway, has a huge collection of national anthems in MIDI format. The inventory is probably greater than 100 items from around the world. National anthems are useful for DXers of the tropical bands. Hearing a Latin American or African sign-off with not so easy to understand audio may be at least tentatively identified by the national anthem, and the MIDI files on these pages enable comparison to what you have on the tape recorder. Tune to **http://home.sol.no/~go01/anthems.html** and crank up the volume.

### Hello from Japan!

"We (the Asian Broadcasting Institute) opened our web page on internet in August, 1997... Our URL is **http://www.246.ne.jp/~abi/**." Toru Yamashita, President of the Asian Broadcasting Institute and the announcer of Radio Japan's Korean Service, pointed us to the ABI site. Unfortunately, most of it is in Japanese, but we expect this to change. Keep an eye on the page. If the ABI sounds familiar to you, you may know ABI member Tetsuya Kondo, a long-time contributor to the World Radio TV Handbook. Have a question? You can write Yamashita at toruyama@yk.rim.or.jp.

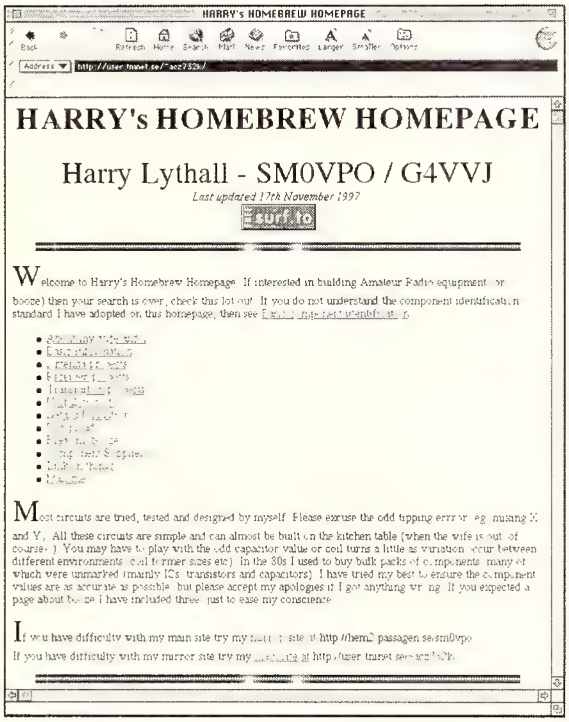
### Links, more links, *lots* of links

The Northern Berkshire Amateur Radio Club in Massachusetts, USA, recently completed a comprehensive sweep of the Web to clean up its 1400+ amateur radio and shortwave entries on its link pages. Automation now checks the links every two weeks, and dead links are removed. New links that you add are posted within seven days.

Now BARC has made its links page available to others through an automated mailing list. This seems like an offer that an amateur radio club running a Web site cannot refuse. A formatted HTML page — all links, one page, about 120k and ready for posting — is mailed to you each week. To look at the links collection, the URL is **http://www.nobarc.com/links/**. To sign up for the mailing list, go to **http://www.nobarc.com/nobarclinks.html**.

....☞

# Baudwalking (continued)



http://user.tninet.se/~acz732k/

## HARRY's HOMEBREW HOMEPAGE

### Harry Lythall - SM0VPO / G4VVJ

*Last updated 17th November 1997*

Welcome to Harry's Homebrew Homepage. If interested in building Amateur Radio equipment (or booze) then your search is over, check this lot out. If you do not understand the component identification standard I have adopted on this homepage, then see [illegible]

Most circuits are tried, tested and designed by myself. Please excuse the odd tipping error (eg mixing X and Y). All these circuits are simple and can almost be built on the kitchen table (when the wife is out of course). You may have to play with the odd capacitor value or coil turns a little as variation occur between different environments (coil former sizes etc). In the 80s I used to buy bulk packs of components, many of which were unmarked (mainly ICs, transistors and capacitors). I have tried my best to ensure the component values are as accurate as possible, but please accept my apologies if I got anything wrong. If you expected a page about booze I have included three, just to ease my conscience.

If you have difficulty with my main site try my [illegible] site at http://hem2.passagen.se/sm0vpo

If you have difficulty with my mirror site try my [illegible] at http://user.tninet.se/~acz732k

## Home-brew amateur radio projects

Harry Lythall, SM0VPO/G4VVJ, has an active and comprehensive Web page with a significant number of projects. He writes "...My homepage is getting bigger and will continue to do so until Telenordia tell me I have run out of disk space on the server! Since the last list I have almost finished my General Coverage receiver, and it works a treat. I have added a 10 (15) watt HF linear amplifier, complete with the PCB foil, and it uses cheap CB-type PA transistors...".

Here's a sampling of a few of the categories Lythall covers:

### Antennas

- Remote-powered antenna pre-amplifier for HF and VHF applications.
- Remote antenna tuner for high 'Q' QRP HF antennas.
- Dipole antennas are rather basic, but all antennas are quite important when using only reasonable amounts of power.

### QRP

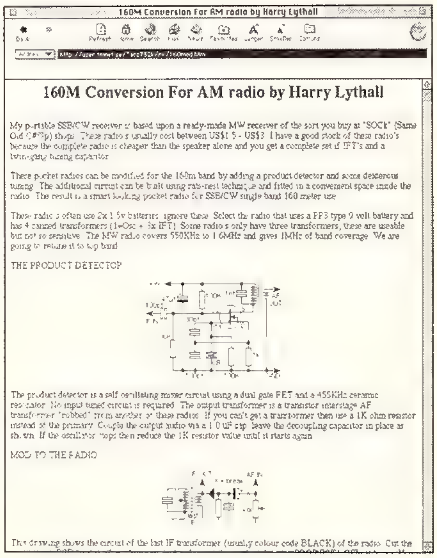
- A short antenna that makes portable and restricted spaces a real possibility, even for the lower frequency HF amateur bands.
- A balcony antenna mount with information about a simple QRP antenna for city dwellers.
- An antenna based upon a packing crate lid is easily disguised/hidden or for mobile use. No antenna visible = no TVI!
- An 80 metre frame antenna for the balcony, mobile or holidays.

### Receivers

- A general-coverage valve receiver currently under construction. This project will be added to as I complete the receiver.
- Cigar Box receiver, a companion battery valve receiver to the Cigar Box transmitter. Don't knock valves, they can still have their uses!
- An Integrated Circuit HF receiver based upon an IC primarily intended for MW AM use. It still gives a good account of itself on the HF bands.
- An HF direct conversion receiver that can be built in minutes using test gear normally found in the shack.
- A single transistor regenerative receiver that gives excellent results on the lower HF bands. When I first built this circuit I used a White-Spot transistor, so that may give you an idea of my age!
- Receivers for HF and VHF based upon the once-popular ZN414 radio IC. In these applications it is used as an IF amplifier and detector in a variety of circuits. Can be used for FM using slope detection.

### Transmitters

- VHF FM 'bug' transmitter with short range. Designed as an educational project to inspire interest in the younger amateurs-to-be. But ensure that little Johnny does not hide it in your bedroom!
- 250mW HF bands CW transmitter with an optional 4 watt PA, if you feel you would like to compete with other QRO-QRP stations.
- 5-Watt HF bands CW transmitter using a TTL IC (7404). This matchbox-sized xmtr will need a heatsink, so don't leave the matches in the box!
- LM317 experimental LF/HF bands transmitter using a voltage regulator! Over 10 watts on Top Band [160M], with the right regulator.
- One-valve CW transmitter for those who like a little bit of nostalgia. One watt using a 1T4 (DL91) battery valve.



http://user.tninet.se/~acz732k/rx/160mod.htm

## 160M Conversion For AM radio by Harry Lythall

My portable SSB/CW receiver is based upon a ready-made MW receiver of the sort you buy at "SOCk" (Same Old C#?p) shops. These radio's usually cost between US$1.5 - US$3. I have a good stock of these radio's because the complete radio is cheaper than the speaker alone and you get a complete set of IFT's and a twin-gang tuning capacitor.

These pocket radios can be modified for the 160m band by adding a product detector and some dexterous tuning. The additional circuit can be built using rats-nest technique and fitted in a convenient space inside the radio. The result is a smart looking pocket radio for SSB/CW single band 160 meter use.

These radio's often use 2x 1.5v batteries, ignore these. Select the radio that uses a PP3 type 9 volt battery and has 4 canned transformers (1=Osc + 3x IFT). Some radio's only have three transformers, these are useable but not so sensitive. The MW radio covers 550KHz to 1.6MHz and gives 1MHz of band coverage. We are going to rebate it to top band.

THE PRODUCT DETECTOR

The product detector is a self oscillating mixer circuit using a dual gate FET and a 455KHz ceramic resonator. No input tuned circuit is required. The output transformer is a transistor interstage AF transformer "robbed" from another of these radios. If you can't get a transformer then use a 1K ohm resistor instead of the primary. Couple the output audio via a 1.0 uF cap, leave the decoupling capacitor in place as shown. If the oscillator stops then reduce the 1K resistor value until it starts again.

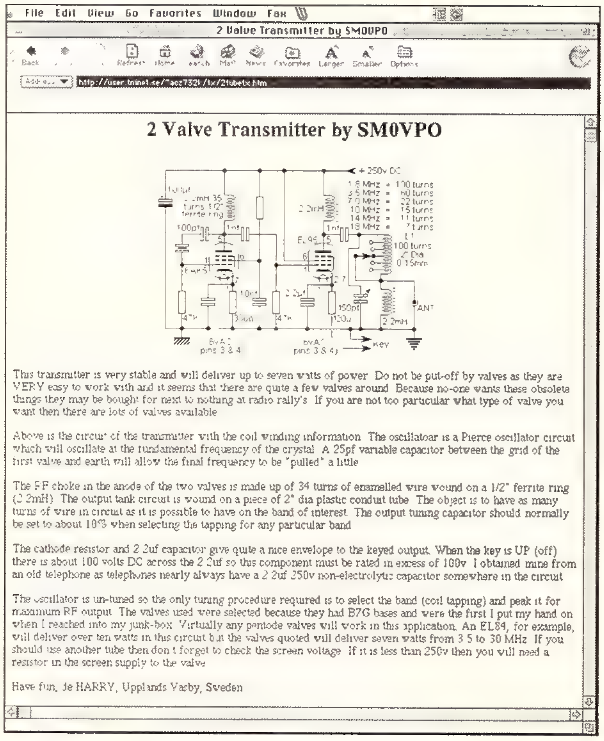
MOD TO THE RADIO

This drawing shows the circuit of the last IF transformer (usually colour code BLACK) of the radio. Cut the

- Two-tube CW transmitter using mains valves. Can be modified for almost any 250V + 6.3V mains bottles.

Visit Harry's page at **http://user.tninet.se/~acz732k/**. Just a word of caution, though: you are on your own, as neither the editors of Radio and Communications nor I have tested any of the circuits described.

Where have been travelling on the Web lately? Tell me your secrets by sending e-mail to trs@trsc.com. Our Web site is **http://www.trsc.com/**.



http://user.tninet.se/~acz732k/tx/2tubetx.htm

## 2 Valve Transmitter by SM0VPO

This transmitter is very stable and will deliver up to seven watts of power. Do not be put-off by valves as they are VERY easy to work with and it seems that there are quite a few valves around. Because no-one wants these obsolete things they may be bought for next to nothing at radio rally's. If you are not too particular what type of valve you want then there are lots of valves available.

Above is the circuit of the transmitter with the coil winding information. The oscillatoar is a Pierce oscillator circuit which will oscillate at the fundamental frequency of the crystal. A 25pf variable capacitor between the grid of the first valve and earth will allow the final frequency to be "pulled" a little.

The RF choke in the anode of the two valves is made up of 34 turns of enamelled wire wound on a 1/2" ferrite ring (2.2mH). The output tank circuit is wound on a piece of 2" dia plastic conduit tube. The object is to have as many turns of wire in circuit as it is possible to have on the band of interest. The output tuning capacitor should normally be set to about 10% when selecting the tapping for any particular band.

The cathode resistor and 2.2uf capacitor give quite a nice envelope to the keyed output. When the key is UP (off) there is about 100 volts DC across the 2.2uf so this component must be rated in excess of 100v. I obtained mine from an old telephone as telephones nearly always have a 2.2uf 250v non-electrolytic capacitor somewhere in the circuit.

The oscillator is un-tuned so the only tuning procedure required is to select the band (coil tapping) and peak it for maximum RF output. The valves used were selected because they had B7G bases and were the first I put my hand on when I reached into my junk-box. Virtually any pentode valves will work in this application. An EL84, for example, will deliver over ten watts in this circuit but the valves quoted will deliver seven watts from 3.5 to 30 MHz. If you should use another tube then don't forget to check the screen voltage. If it is less than 250v then you will need a resistor in the screen supply to the valve.

Have fun, de HARRY, Upplands Vasby, Sweden

## Satellite Tracking

NASA writes (on a Web page) "Did you know there are over eight thousand satellites orbiting Earth? Not all of them are operational, or very interesting, but tracking stations around the world follow their locations." J-Track lets the Java-equipped browser plot spacecraft (MIR, the Shuttle, et al), weather and a selection of amateur radio satellites.

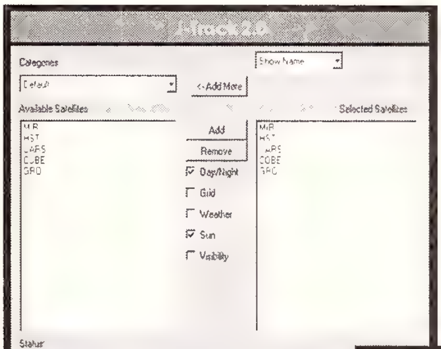
Version 2 of J-track has some Java quirks, and sometimes the pages freeze. But it usually does load — albeit slowly on a 28.8k connection — into our browsers. Get something to drink from the kitchen. When you get back, you'll have a constantly updating screen.

Plug into **http://liftoff.msfc.nasa.gov/RealTime/JTrack/** and have a go.

Then move over to J-pass and see how the satellites appear in your own horizon. Change the coordinates to your location, then pick the satellite track. The illustration shows the path of MIR in our sky. J-pass is a static view. Advance through upcoming orbits using the 'Next Pass' button to see when MIR will be sufficiently high off the horizon to hear the two metre signals... and hope the crew is awake and has some free time to communicate with the grounded amateurs below!

Make a pass at **http://liftoff.msfc.nasa.gov/RealTime/JPass/JPass.html** to load this useful tool.

We open two instances of the Netscape browser... and load J-track and J-pass simultaneously. It's a blast, whether you want to communicate with a NASA shuttle flight or MIR... or get outside at twilight (sunrise or sunset) on a clear day and watch an orbiting object pass overhead.

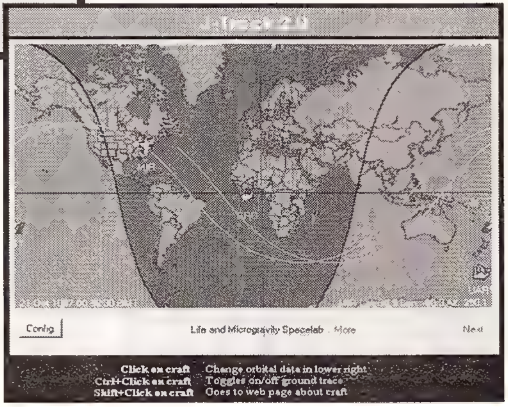


Available Satellites: MIR, HST, UARS, COBE, GRO

Selected Satellites: MIR, HST, UARS, COBE, GRO

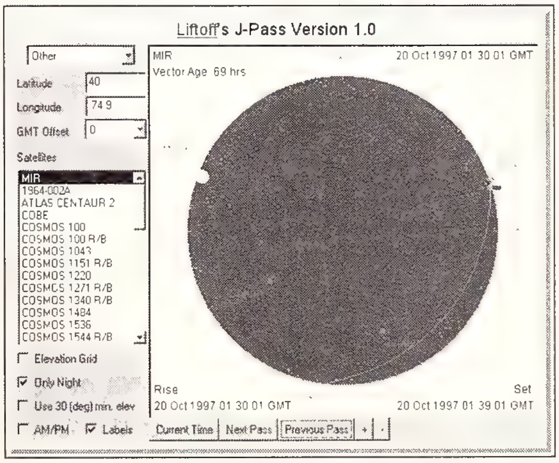
☑ Day/Night
☐ Grid
☐ Weather
☑ Sun
☐ Visibility

***Left:*** *Interested in visually observing MIR and other objects whirling about the earth? On the configuration screen, click on 'weather' to add cloud cover to the world map.*



Click on craft — Change orbital data in lower right
Ctrl+Click on craft — Toggles on/off ground trace
Shift+Click on craft — Goes to web page about craft

***Right:*** *When we fired up J-track, the Russian MIR space-station was upon us. Unfortunately some local 'boobs' set up a packet network on 145.79 MHz, making it impossible for us to hear anything on 145.8 MHz.*



Other
Latitude 40
Longitude 74 9
GMT Offset 0
Satellites: MIR, 1964-002A, ATLAS CENTAUR 2, COBE, COSMOS 100, COSMOS 100 R/B, COSMOS 1043, COSMOS 1151 R/B, COSMOS 1220, COSMOS 1271 R/B, COSMOS 1340 R/B, COSMOS 1484, COSMOS 1536, COSMOS 1544 R/B
☐ Elevation Grid
☑ Only Night
☐ Use 30 (deg) min. elev
☐ AM/PM ☑ Labels
MIR 20 Oct 1997 01 30 01 GMT
Vector Age 69 hrs
Rise 20 Oct 1997 01 30 01 GMT
Set 20 Oct 1997 01 39 01 GMT

***Left:*** *Unlike the constantly-updating J-track screen, J-Pass is a static snapshot that can be advanced (or back-tracked) to the next (or previous) pass for the selected satellite. This horizon view shows the path, rise and set times of MIR. MIR tracks just above our south-western horizon (compare this to the location on the J-track image). J-Pass also shows the positions of Jupiter, Saturn and the rising moon.*

## Ramping up the Internet

*... an occasional series of hints and tips*

Summer is here and vacation travel is under way. Or do you travel for business? Away from the home or office, access to e-mail may be difficult or inconvenient. Or does your employer frown upon personal e-mail posted through company e-mail servers? Here is a free solution that only requires you to find a computer with access to the Web and a Web browser.

Hotmail is one of a number of free e-mail providers. (The catch on all of them is that you must complete a user profile (age etc.) when signing up and endure a bit of advertising; Hotmail, in our opinion, is the least annoying provider.) Hotmail's URL is **http://www.hotmail.com/**.

After you set up your account, you can create folders and an address mailing list. Then click on the 'options' button from the left-hand menu. Select 'POP Mail'. The next screen allows you to configure up Hotmail for up to four e-mail sources.

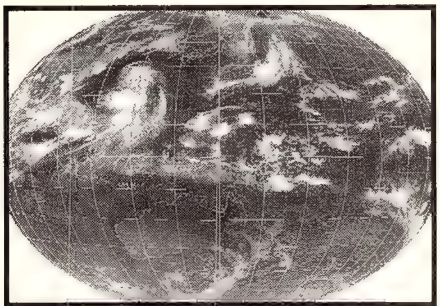
Three pieces of information per e-mail account are required: POP server name, user name and password. Don't know where to get this information? Look at the user settings of whatever e-mail program you use. The server name typically starts with 'mail...', eg, mail.abc.com.au. The user name is typically the part ahead of the '@' in your home e-mail address, eg, 'trs' out of 'trs@trsc.com'. The password is the password you use to log into your local ISP.

Leave the timeout and port numbers set to the suggested defaults. We select the option to leave the mail on the home server so we don't have to deal with file attachments while travelling, but the choice is yours. (When home, when downloading from our ISP using Eudora Pro, the messages read via Hotmail show as previously read, so it is a simple to tag and delete a number of incoming messages en masse, and deal only with the file attachments.) Click on 'OK' at the bottom of the screen to save your settings.

That's it! When away from home, dial into Hotmail and enter your Hotmail name and password. Click on the left-hand menu button 'Inbox'. On the Inbox screen, click on the 'Pop Mail' button atop the page... and a few seconds later the mail addressed to your home e-mail accounts will appear in the Hotmail inbox. You can then read, delete, and reply to those messages, using Hotmail folders as desired.

There is one caveat. Some companies and ISPs block e-mail from certain addresses frequently used by SPAM bulk e-mailers to hide their true identities. Unfortunately '@hotmail.com' is one of those addresses. For example, we could not send e-mail to a sales rep at Adobe; the mail was rejected by the Adobe server.

**THE INTERNET, EMAIL AND OTHER THINGS OF GENERAL INTEREST...** ***By Thomas R. Sundstrom, W2XQ***



# WEFAX SATELLITES

*By Arthur Andrews, VK2AAE*
andy@hypermax.net.au
57 Araluen Lane, Wollar 2850

There has certainly been a lot of severe weather activity in the Northern Hemisphere during their summer months, with above-normal incidences of hurricanes and typhoons which caused a great loss of life and a tremendous amount of damage. Some of these storms were of a magnitude not normally experienced during normal seasons.

**Figure 1**, below, shows a GMS 5, visible light image of a Super Typhoon which formed in the North Pacific in early November. The vast area covered can be gauged by looking at the lines of latitude and longitude encompassing the typhoon. The abnormal weather in the Northern Hemisphere is being attributed to the El Nino Effect which, whilst producing too much rain in some places, is causing drought in the Southern Hemisphere. The lack of tropical cloud south of the Equator is quite noticeable at the time of writing in mid November. It will be interesting to see whether we have more or less cyclonic activity this year.

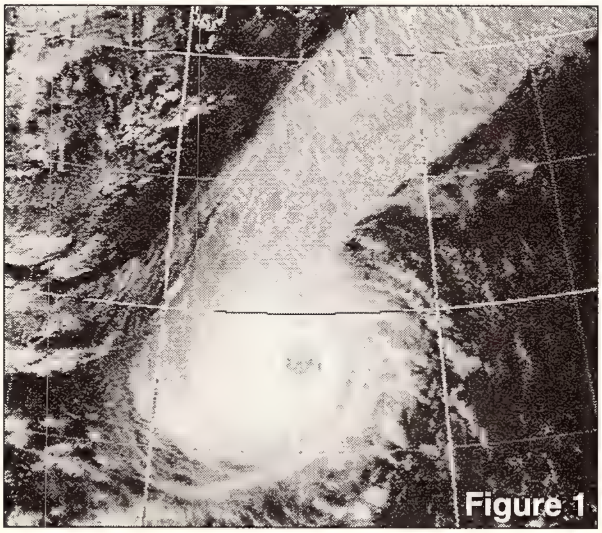


Figure 1

I have often wondered why these cyclonic storms are called by different names in various areas. Storms that develop in the Atlantic Ocean or Caribbean are called Hurricanes which is derived from Huracan, the West Indian god of storms. In the Pacific Ocean, north of the Equator, they are called Typhoons, possibly from the Chinese word tai fung. In the South Pacific and Indian Oceans these storms are known as Tropical Cyclones, probably named after the Cyclops of Greek mythology, a race of one eyed giants who forged thunderbolts for the god Zeus. The hurricanes, typhoons and cyclones of the Northern Hemisphere spin anticlockwise, whilst the cyclones of the Southern Hemisphere spin clockwise. They say bath water going down the plug hole displays the same characteristics, but I don't know if that is true. I read somewhere that Cyclones were first named at the turn of the century by a Clement Wragge working at the Queensland Weather Centre. Evidently he used to name them after politicians or other people he did not like. Until quite recently these storms were given girl's names but now are given alternate male and female names from a list drawn up before each cyclone season.

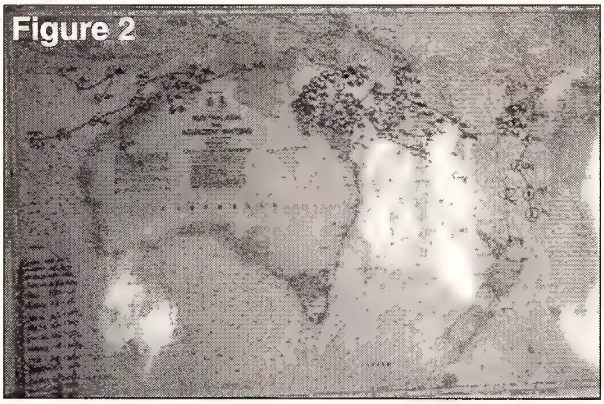
I look forward to the cyclone season, as it interesting to watch these storms going through their various stages to eventual decay. I had a large maritime map laminated and trace each cyclone's path as they occur. (**Figure 2**, above.)

On the weather satellite front there are still no Wefax images from the Chinese geostationary satellite **Feng Yun 2b**. Jim up in Queensland has detected carrier-only transmissions but no actual images.

**NOAA K**, (**NOAA 15** when successfully placed in orbit), is now due to be launched on February 16, 1998.

The **Seawifs** satellite continues to give good non-encrypted eight-channel images on 1702.5 MHz and credit must be given to *Orbimage* for allowing encryption-free images to be transmitted for satellite enthusiasts to receive. I believe that I was the first private person in Australia to receive the images from this satellite and my colour image of South Australia was posted on the Internet by Timestep in England. **Figure 4** (at the bottom of Page 21) shows a grey-scale image of Tasmania captured from Seawifs. The satellite will be mainly used for the study of the seas and oceans. Data will probably commence to be encrypted in January 1998.

There is another interesting satellite in orbit at the moment named **Sputnik Model** to commemorate the launching of the first man-made satellite ever, by the Russians. The satellite was built by French and Russian students and launched by hand from the Mir spacecraft. (Actually, they built two of them and transported both to Mir, just in case!) The signal can be heard on 145.82 MHz in either FM or SSB modes. Although the satellite transmits with the power of only 100 mW there are many reports of it being received in Australia using nothing more sophisticated than hand-held scanners using their normal antenna.

Figure 2


## Back to HRPT...

A few months ago I started an article on my HRPT station, and I seem to have been side-tracked since. In the previous article I had described the external equipment — dish, rotator, LNA etc — leaving what was inside the shack until now.

The inside system consists of two computers — one a 486, the other a 386 — plus the HRPT receiver, antenna rotator controller, data decoding card and software.

As mentioned previously, getting into HRPT is not cheap, but if it can be afforded it will provide you with high resolution images from five different spectral channels and maybe occasionally an extra bonus of a commercial imaging satellite such as Seawifs for a short time.

Although most HRPT systems are commercially made it is possible to build your own like Jim and Peter up in Queensland. However, it is not a proposition for the ham-fisted like me

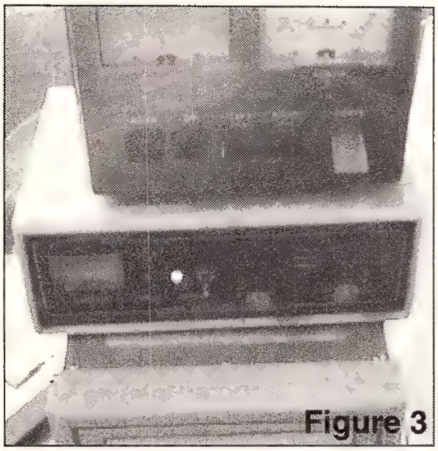


Figure 3

and requires some good test gear for alignment etc. For those who have the technical aptitude there is a way that you could build up a comparatively cheap system. Roberto Ferrari and Enrico Falconelli in Italy have produced a PC board and software which will allow you to decode HRPT signals from the NOAA satellites. They use an Icom IC-R100 scanner as a receiver, taking the signal at the IF. Presumably this could be done with any receiver of that type.

The PC comes with all the essential hard-to-get components already mounted and they say all other components are low cost and easy to buy. The board costs $US200 and comes with the software and schematics For those with Internet facilities, more details can be found at **http://www.msoft.it/noaa95** and a free copy of the software can be down-loaded. Failing that you could write to Enrico Falconelli, Str. Calciati, N.12, 28100, Novara, Italy.

I know that Peter Williamson, who used to make the excellent GMS receivers, has experimented with this board and I hope to persuade him to write an article on the subject for this magazine.

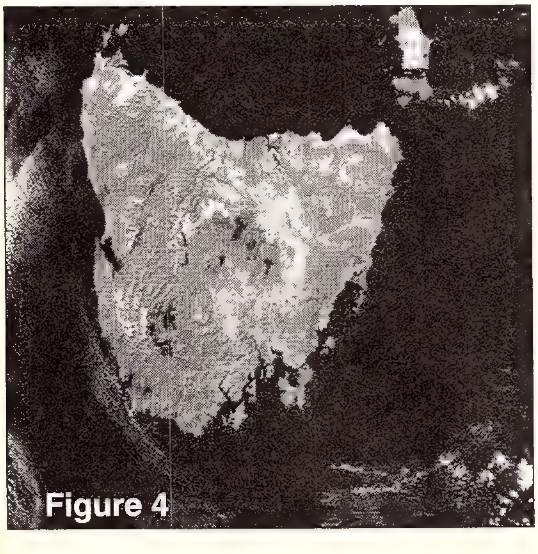


Figure 4

Anyway back to my system... I have to use two computers for the system, the 486 DX for receiving the HRPT (this computer is also used for capturing the GMS images), and the 386 for running the satellite tracking software.

I use the Timestep 5 channel + 1 spare HRPT external receiver which is connected to the Timestep decoder board in the 486. The receiver draws its operating power from the computer through the decoder board and supplies 12VDC up the coaxial cable to the LNA. The receiver is simple to operate with a functional front panel consisting of a channel selector switch, RF Gain control, on/off switch, a power LED, a Data LED and an S-meter. As the data signal is not audible to human ears there is no audio function. When the receiver begins to receive data the yellow Data LED lights up.

**Figure 3**, above left, shows the HRPT receiver with the Kenpro rotator controller box on top. I read off the az/el information from the 386 and adjust the rotator manually.

The collected data is decoded by the card and put into a temporary file for initial viewing. If you are receiving all five spectral channels, a good near-overhead pass can take up between 60 and 70 Mb of space, so a large HD is required.

You do not have to receive all five channels; you can select which channels to receive prior to receiving. The images can then be viewed and manipulated with the excellent Timestep HRPT software and also exported to other image-enhancing software. The data in the temporary file can be renamed as a permanent file; if this is not done the data will be overwritten when the next pass is received. For normal weather viewing, APT is more than adequate and you don't need big bucks, but for more serious study of sea temperatures, currents and vegetation indices, HRPT is a must.

The requests for the WXSAT software has now slowed to a trickle after three months and hopefully there are a lot more new weather satellite enthusiasts out there now. If you have received an image which you think may be of interest to other readers please send it in to me either on disk or over the Internet together with a description of what equipment you are using (eg receiver, antenna, software etc). Images should be grey scale, as colour pictures cannot be printed within this article, more's the pity, and preferably in the TIF format.

Michel van der Walle of Ballarat sent me a picture he captured from MET 3/5 showing the Antarctic ice fields at the bottom of the image. (See **Figure 5**, below). Due to space constraints I could not include the whole image, but the area selected shows a large depression to the left and the ice fields can clearly be seen at the bottom left. Michel watches the expansion and contraction of these ice fields with great interest. Unfortunately at my location I am too far north to get a sight of the ice fields.

I have an urgent plea from a reader who, whilst in America a couple of months ago, showed a weather satellite enthusiast over there my article in the July edition of R&C. Evidently the bloke showed so much interest that our reader felt obliged to let him have it, thinking it would be easy to get another copy when he came back to Australia.

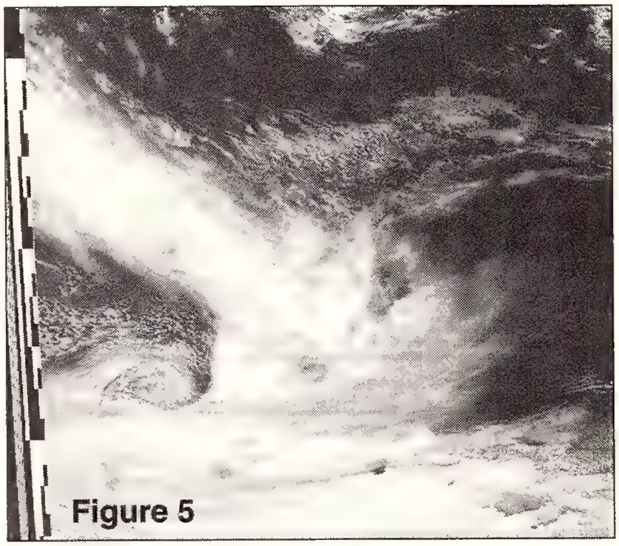


Figure 5

However, on his return, he contacted the publishers who told him there were no copies available as they had been sold out. As there were several articles our reader wanted to keep can anyone help him.

He wants the July 1997 issue of Radio & Communications and, of course, will pay full price and postage. Any reader who can help please contact Bill Babb, 76 David Avenue, East Keilor, Victoria 3033.

Compliments of the season to all readers and thank you all for your support regarding my articles.

Until next year, goodbye and good luck.

## ANARE 1997 — 50th anniversary year

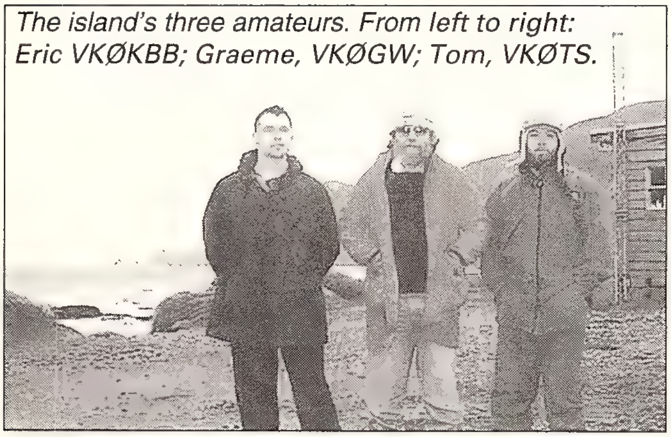
# Life on Macquarie Island

### By Tom Stokes, VK0TS

Tom, VK0TS spent a year in Antarctica, on one of the most remote yet, DX-wise, sought-after spots on the globe. He sent this account of his year, and of life 'in the freezer', to borrow a line, to Jim, VK9NS, who passed it and the accompanying photos, on to us for publication.

Here is the concluding second part of the story.

*The island's three amateurs. From left to right: Eric VK0KBB; Graeme, VK0GW; Tom, VK0TS.*



Mt Elder is reputed to be the windiest place on Macquarie Island, and is not often visited. Unfortunately, I have had several recent trips there, finally replacing the old repeater atop the hill with a five watt upgrade. It is about 5km from the station and access is fairly easy but the working environment is miserable. Freezing and gale force winds are more or less continuous at the repeater site.

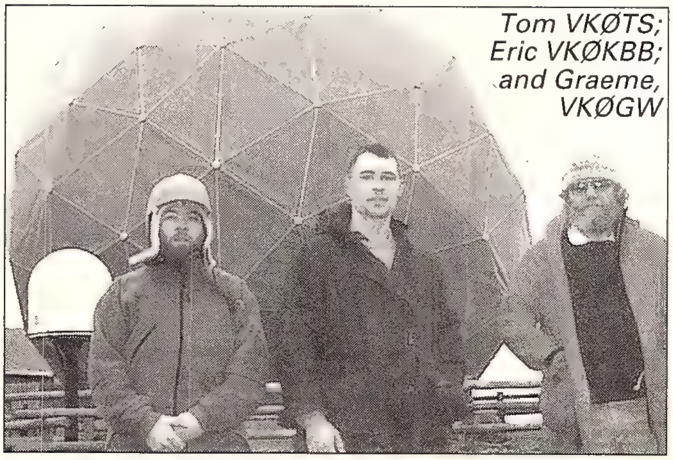
Green Gorge is another site but this is half way down the island and a recent fault to repair the HF radio and upgrade the repeater had me in the field for three days.

### Amateur radio

I took over from Warren Hull, VK0WH, who was on the island for the previous season 1995/96.

Amateur radio activity has always been infrequent with Graeme Currie (Chompers) VK0GC being the most active in recent years. Graeme, VK0GW is also on the island for this season.

I will have left the island by the time you read this, as I was scheduled to depart in November.



*Tom VK0TS; Eric VK0KBB; and Graeme, VK0GW*

In amateur radio terms, I have been able to operate on 80, 40 and 20M quite regularly mainly by the use of skeds to many areas. A timetable and diary has been filled quickly but I cannot always meet the arranged sked as work must come first. My working hours can vary dramatically depending on many factors.

The other night had me working until the early hours of the morning with problems in the digital circuits. However I know that if I am not on the band at sked time people will understand my position. The weather also plays its part since if it is very rough then I cannot make it to the shack. This often happens given the extremes of the weather here. There have been many cases of being called into the field resulting in lost amateur radio skeds, as I can be away from the station for several days.

Of course, conditions to VK and ZL are usually excellent with QSOs almost always possible on 20 and 40 during my day and 80M in the evening. I have always been able to contact Jim, VK9NS on Norfolk Island for DX skeds so HF work is great from this location.

CW is a major problem but I have managed to work with VK stations but on a world-wide basis it is very difficult.

### Home...

So now, as I write this, I have just a few weeks to go before I head for home. It is a great life on the station and in the field but the island is remote and isolated. The length of stay makes things hard on occasions and, having been here for a year now, I am really starting to think a lot of home, and starting to count the days left on the island.

I have really enjoyed my stay on Macquarie having seen all of the sights and lived through the complete biological seasonal cycle of the island. The station's population has

doubled once again as the gradual changes are made ready for the next ANARE Expedition team which will take our place. As my time draws closer to leaving the more I am looking forward to it.

The season has already started to change with the penguins and the seal increasing in numbers daily. There are over 2,500 seals in the isthmus area alone, and seal pups are being born every day. The noise in these seal harems is quite incredible and all is a wonderful sight to see and hear.

The Sooty Albatross can also be seen, and these are very photogenic birds and, being very friendly this also helps us to take good photographs. They often fly around you as they are very curious and if you are near their nests they will come very close, often within a couple of metres.

In the same way I recently visited the king penguin rookery at Lusitania Bay and at the moment there are thousands of chicks there.

I sat down for a time on the rocks and was soon surrounded by these curious birds pecking at my feet and so on just checking me out. They are very funny to watch and I spent some time there in very nice weather enjoying their company and antics.

### Background history

A sealer, Captain Frederick Hassel-borough, in the brig Perseverance, discovered Macquarie Island on July 11, 1810, a discovery which led to intense commercial exploitation of the island's wildlife which finally ceased in 1919. The fur seals were hunted almost to the point of extinction for their rich fur, and penguins and elephant seals for their oil. The island eventually became a wildlife sanctuary in 1933 and a nature reserve in 1997.

Sir Douglas Mawson established the first scientific research station on the island in 1911, and the Australian National Research Expeditions (ANARE) station has operated there continuously since 1948. Thus, in this special 1997 Jubilee Year Macquarie Island has the distinction of being the only ANARE station celebrating 50 years of continuous operation.

For each of these years the ANARE station has been and is currently home for up to 20 expeditioners conducting research programs into many scientific areas, including meteorology, seismology, geomagnetics, physics, biology, medical research and pollution monitoring. The island is a sub-Antarctic Sanctuary with many species of seal, penguin, albatross (including the wandering albatross).

From the October 25 to 31 I used the VI0ANRE special callsign allocated to mark the 50th Anniversary of ANARE. I hope we made a QSO...

Perhaps one day in the future I may return to the island and once again experience the wonders of nature in this remote and special area of the world. 73 from Tom, VK0TS

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# Power for the masses...

By Neil Duncan, VK3ND and Chris Edmondson, VK3CE

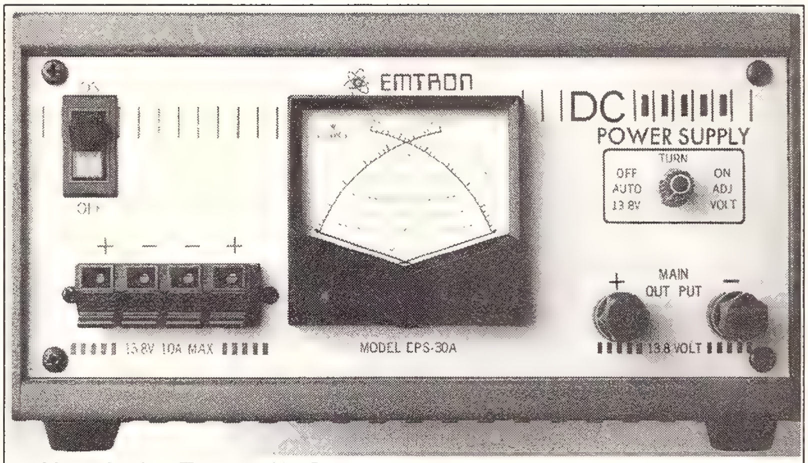
Some radio communications monitoring receivers and transceivers are fitted with inbuilt power supplies. Some of us end up with a tangle of wires from a mountain of plug pack supplies on the shack floor (and have you ever tried to work out which one is which?!) — while some of us see the light, and whip out to buy a purpose-built do-all DC supply to run all the gear. We put a few of them through their paces...

The majority of modern radio communications equipment runs from an automotive-type voltage of 12 to 14 volts DC. Some people buy radios which plug straight into the mains, but that means you can't take it mobile without first buying a *very* long extension cord. Buying DC-powered equipment and having a large DC power supply in the shack is often the answer, as multiple smaller units like plug pack supplies may either prove inefficient or simply incapable of keeping up with the demands of the station.

Power supplies come in all shapes and sizes, and there are as many different configurations for them as there are uses for them. We decided to look at a couple of different applications only, which meant that all contenders would need screw-on and banana clip-type connections, be stand-alone, have an appropriate type-approval and, basically, be the sort of thing you could easily see used in *your* shack. And, equally importantly, we wanted them to be locally-produced *Australian* items.

Having decided not to reach for the Icom / Kenwood / Yaesu type of thing (or Dick Smith's hot-selling $299 imported linear supply), we realised that there's not as many hobby radio-oriented power supplies made here as you might think. (And now, having said that, we'll probably get buried in indignant letters!) In the end, we actually narrowed the field to two major lines — a range of compact linear supplies made by **Imark Communications** in Melbourne, and a range of both linear and switch-mode supplies made by **Emtronics** in Sydney.

We decided to limit ourselves to looking closely at just six supplies from those two manufacturers. Despite the overall smallish number of manufacturers, there's quite a bit of duplication in there, and we were really trying to cover the market our readers would be most interested in... However, there are many other local supplies made by such folk as Arlec, RFI, Transwest, Panther, GAF and more.



Here is the Emtron EPS-30A linear supply, which is rated at a continuous 30 Amps. Note all the outlets! The Emtronics range of supplies is being exported to markets around the world...

We started with two linear supplies — rated at one and two amps continuous duty — of interest to CB operators, SWLs, scanner users and amateurs wanting to power up their HTs. Both are magnificently made, and both come from Imark. Then we stepped up to supplies for any of the above people using a lot of gear, or an amplifier or two, plus the amateur wishing to power the traditional HF transceiver. We next checked out a number of both linear and switch-mode supplies in the 20 to 40 Amp range made by Emtronics in Sydney.

Thanks to the people at Imark, we were able to put a variety of supplies through their paces on a power supply analyser, which allows you to vary the load on the supply and observe the results. While the supplies looked at here performed well, some of the opposition units were not so fortunate. Some of the cases fell apart, while in one case the voltage simply refused to 'fold back' under conditions of substantial overload — potentially very damaging to whatever you've connected to the supply. One was physically noisy under full load, with its transformer laminations happily buzzing away, while a couple of others were so flimsy that their binding posts were quite unsuited to the task — you wouldn't want to regularly connect and disconnect wires for the load!

So what we wanted was quality product and, as you'll read, we're very confident that a choice from either of these ranges will get you the best quality you can reasonably expect to get.

## Linear versus switch-mode

In the world of power supplies, the word 'conventional' probably applies most to 'linear' supplies. These are generally the large, heavy units with few components and a big transformer. Large and heavy often don't mix with modern equipment, such as compact portable devices, fax machines or personal computers, and in these applications you're more likely to encounter switch-mode supplies, which are generally far lighter and far more compact than linear supplies for a given output capacity. In fact, we don't think we've ever encountered a mains-operated PC which did *not* have a switch-mode supply, so it seems they're also pretty reliable as well as compact these days.

In a linear supply, the 240 VAC source first passes through a power transformer, is then rectified at the mains' 50Hz, and is converted to DC via the use of rectifiers and biggish filter capacitors before being cleaned up by voltage-regulating solid-state devices.

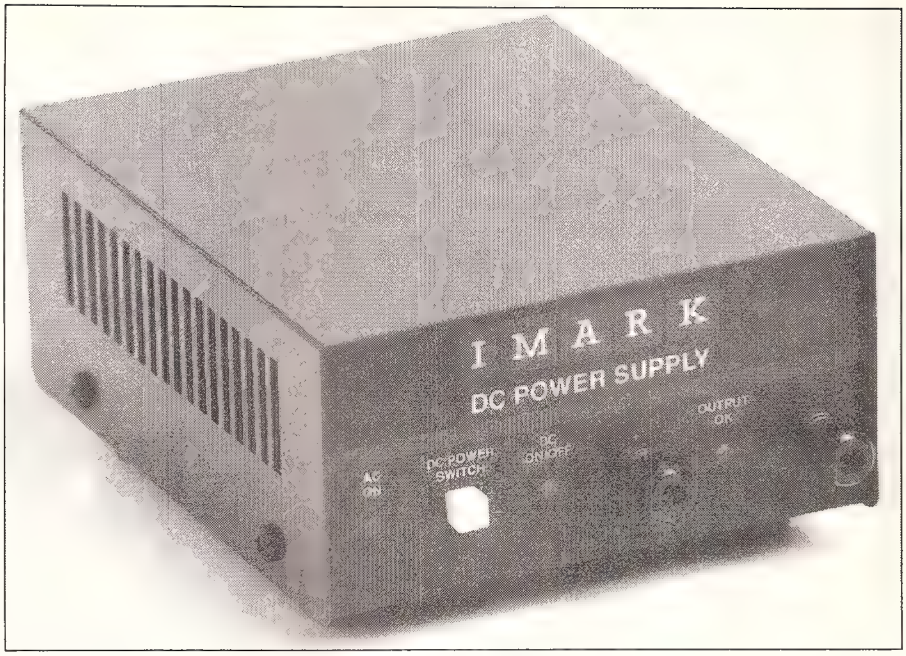
Switch-mode power supplies, on the other hand, are in effect power-transformerless supplies. In these, the mains is converted to 13.8 volts DC via a series of tricks including the generation of a very high frequency alternating current directly form the mains. At such frequencies, power transformers are quite different. They are more efficient, lighter, and are matchbox-sized. Similarly, the filter capacitor specifications are drastically reduced for smoothing at those frequencies, so the result is a smaller, lighter, if considerably more complex power supply.

There is a trade-off when comparing conventional power transformer-based supplies and a switch-mode supply, however. On one hand, weight and size become things of the past, but on the other hand the overall complexity is increased, as is the potential of facing a difficult fault in the future. (The VK3CE fax machine blew up — literally. The technician who pulled the blown supply's smoking remnants from the case described its switch-mode supply as 'Black Science'!)

Switch-mode supplies can be a devil to repair, so when buying such a supply, make sure you buy from a top manufacturer, one that you know you have access to repair facilities should you need them. It is with that background that we looked a the Emtron series of switch-mode supplies.

## Imark PS20 and PS40

The PS20 and PS40 supplies we checked out are physically small 13.8 volt linear supplies rated at one amp and two amps continuous current, respectively. Their peak ratings are three and five amps respectively. Compact and neat, they are hardly larger than one of those very thick paperback books.



These are the babies of the Imark power supply family. The PS60 — which we saw but didn't test — runs three Amps continuous, and 7A peak, and the PS80 runs 4A continuous and 9A peak. At the other end of the scale are military and commercial supplies, which we checked out in a recent visit to the Imark construction plant. The specifications of some of these units are pretty impressive, too. Try output regulation in the order of 1mV all the way from 0 to 20A output, with output ripple better than 1mV at the full rated load. Not bad... in fact, about as good as a very good battery! Look out for a complete inside look at the Imark 'ideas factory' in a coming issue.

Anyway, opening up the PS20 reveals a neat but traditional construction inside with a power transformer and a single PCB. On that board, 6600 mfd of filtering and a pair of three-legged regulator devices occupy the landscape alongside a fuse and a couple of other minor bits and pieces. On the PS40, the size of those interior parts is increased and the number of microfarads is doubled. In both items, the parts count is minimal — a clear hallmark of conventional linear power supply design.

The front panel of these units carries an on/off switch (this switches on the secondary of the transformer, leaving the primary connected to the AC at all times) and a pair of DC connectors. Three LEDs indicate the status of the unit — the presence of AC, DC and whether or not a shutdown has occurred.

The smaller of the two units would be ideal for a whole range of items in the shack. Any portable scanner or hand-held amateur or CB rig would be accommodated with ease by the PS20, but you'd probably be better off with a larger supply like the PS40 for anything requiring a higher current capacity.

In fact, we'd plump for the PS40 from the outset. Although it offers twice the current capacity, the price difference really is minimal. The PS20's RRP is around $69.95, but you step up to the PS40 for only a few dollars more — around $75.95. To go to the PS60 or PS80 is a somewhat bigger financial step, as these are physically larger units.

Those of you 'in the know' may be a bit surprised at those prices, but the benefit of buying Australian, at least in this case, is genuinely magnificent design and construction. The case is very solid indeed, and is metal not the plastic of so many of its cheaper (in more ways than one!) competitors. The binding posts, too, are also rock solid, and the AC power is connected by way of an approved IEC mains connector, rather than the cheap short-cut of hooking the AC lead in through a grommet and soldering the wires to the transformer. In short, this is the sort of supply we'd be happy to connect up to the mains and *leave* there, more or less forever.

In testing, we ran a variety of hand-held transceivers and scanners from the PS20 and a variety of mobile radios from the larger one. If high power transmit was too much for either, they'd simply shut down until the PTT was released, at which time they'd switch straight back on again. No fuses, no mess, no fuss.

In fact, the same thing happened even if you put a dead short over the output terminals. Each supply would simply switch itself off until the situation had reverted to normal. If you think about it, this offers a wonderful protection for your radio gear as well. It would be damned hard to inadvertently hurt anything with such a forgiving supply!

At no time during our testing did we encounter hum or acoustic noise (either from a cooling fan — neither unit has one — or from noisy transformer laminations), nor could we detect any voltage drop whatever. By the time we'd been caning them for several hours they had warmed up a little bit, but not enough to cause concern. We ran a current-thirsty five-inch colour TV off the PS-20 for over three hours and it stayed almost completely cold. (A great movie, too — the Godfather!)

In conclusion, then, the two Imark supplies we tested are traditional linear units, beautifully put together and incorporating substantial components of first rate quality. They should be well suited to radio enthusiasts of all kinds requiring a smaller power supply unit.

## Emtron EPS-20s, EPS-40 and EPS-40R

We'd have to start out by reminding you that we've seen the EPS-20s before. It was, in fact, way back in the very first edition of this magazine, in July 1995. Since then, it's been joined by two brothers, both of which have exactly double the capacity. That makes sense, because each of them has two EPS-20s boards inside.

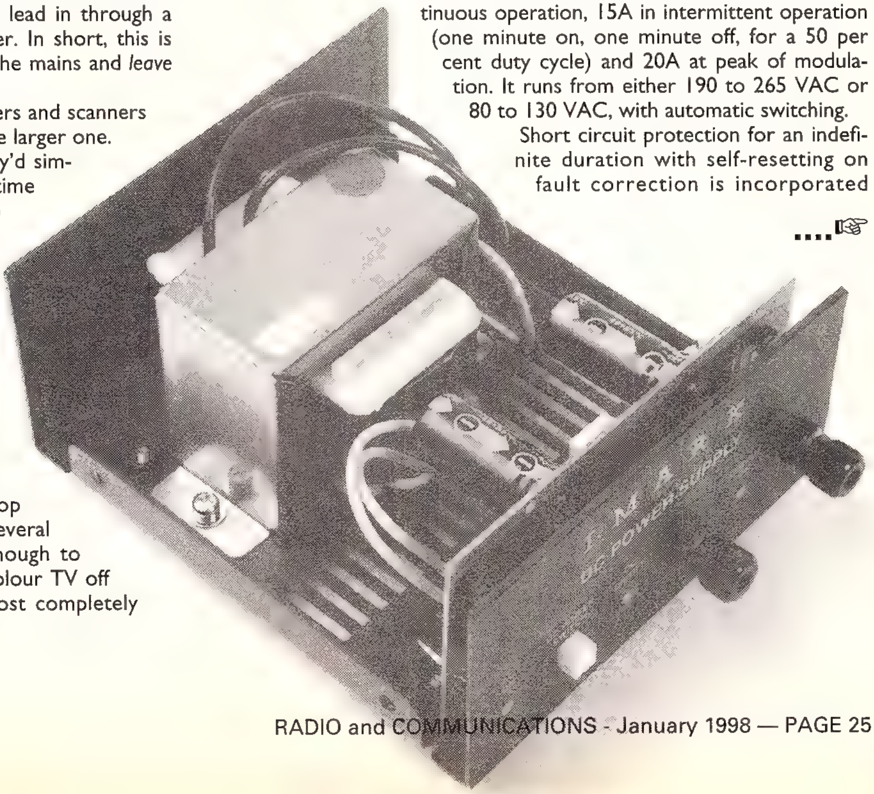
The EPS-20s is a switch-mode power supply of compact construction and of ridiculously low weight given the solid chassis. Perhaps the absence of the large power transformer usually associated with supplies of this class has something to do with it.

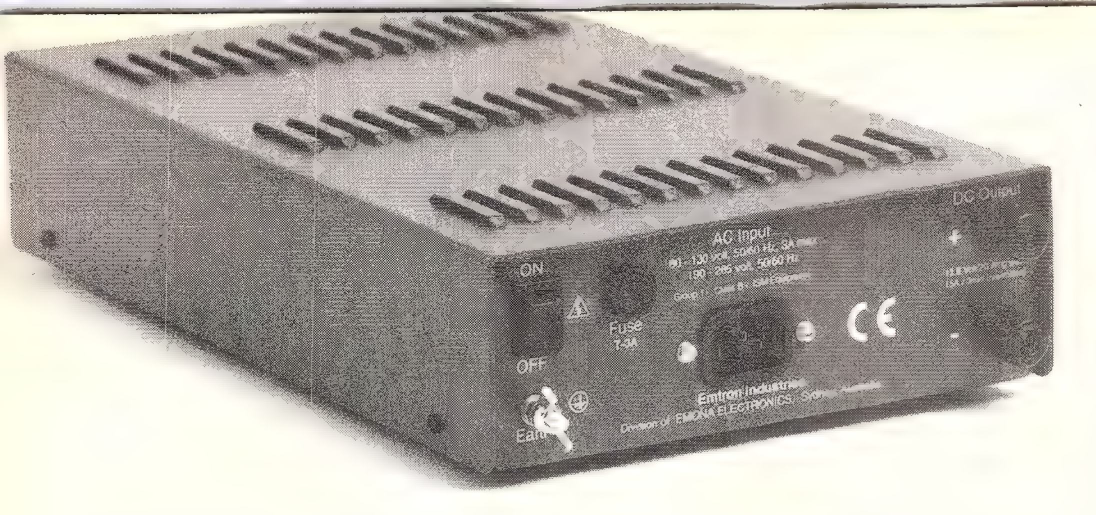
From an amateur's point of view, the main application of the EPS-20 is to power mobile FM transceivers at home, or HF SSB transceivers of the 100W class — and over 1000 of them have been sold for just that purpose in the last two and a half years or so. Even better, it now sells for a price fully $100 less than it was originally released for.

The EPS-20s is capable of supplying 8A in continuous operation, 15A in intermittent operation (one minute on, one minute off, for a 50 per cent duty cycle) and 20A at peak of modulation. It runs from either 190 to 265 VAC or 80 to 130 VAC, with automatic switching.

Short circuit protection for an indefinite duration with self-resetting on fault correction is incorporated

....☞

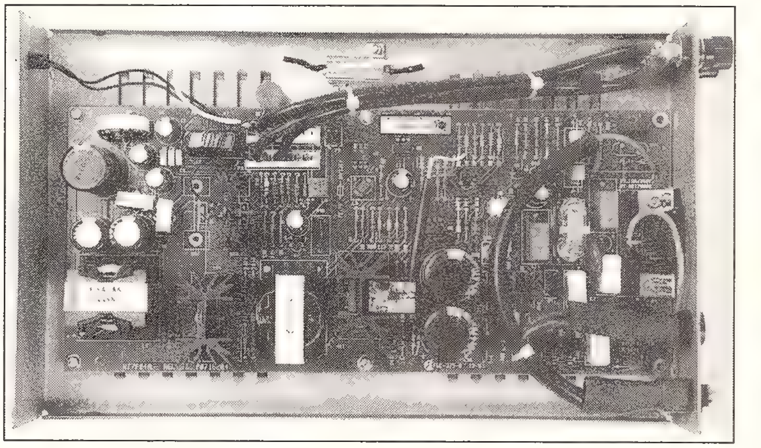




with current limiting operating at 17A typical. There's also thermal protection, over-current protection and over-voltage protection (the latter at 16V with a self resetting crow-bar on the output).

The EPS-40 is a unit featuring a pair of boards from the EPS-20s design, wired in parallel. The 13.8VDC output thus available has a current capability of 30A in continuous operation, 35A intermittent (maximum one minute on, with 50 per cent duty cycle), and a possible 40A peak, typically on peak modulation in SSB applications.

The EPS-40R a larger, rack-mounted version of the EPS-40. The main application of the EPS-40R is within industrial applications, where high efficiency and reliability is required.



The EPS-20s is a quiet little powerhouse. Given its output, and compared to traditional linear designs, it is small and surprisingly light. As with two of the three of these power supplies, the on/off switch is mounted on the rear panel, an abjectly silly place for it to be in our opinion. On the other hand, the DC connectors are also back there with a consequent improvement in tidiness and convenience for most applications.

We powered a variety of high-current devices, including a base station HF SSB rig, a 100 watt UHF amplifier and a 120 watt two metre amp, from the EPS-20s for a couple of days with no noticeable operational difference from our other shack supplies, which are far larger and heavier linear units. A decent 100 watt whistle was maintained with no problem — and no buzz, hum or complaints. More to the point, careful monitoring on receive indicated absolutely no introduced noises, which is sometimes a concern with switch-mode supplies.

A check on a spectrum analyser showed very few undesirable products, and exploded the myth that a switch-mode supply cannot be clean and virtually free of RF hash and noise. Under a variety of loads, a voltmeter across the output showed not the merest budging. Despite the lack of a cooling fan in the smallest unit, nothing became anything more than just warm after an hour of use. They are really 'radio silent' supplies.

The EPS-40 is quite a bit bigger, looking like a tall shoebox. It is also very light but has two fans, mounted left and right of the box. I guess this means keeping the left and right sides reasonably clear of objects. These fans are sensibly quiet but they do give the shack that 'radio room sound' and you are grateful when they shut down as you finish for the day. The only adornment on the front panel is a 'power on' light.

The EPS-40R is a rack-mounted version of the EPS-40 with identical specifications. It has a pair of meters, however, for current and voltage display. The unit supplied for review had several prototype characteristics about it which would be unfair to enumerate. Suffice to say that the manufacturer promised fixes for the all and was grateful for the feedback. We powered a solid-state HF rig, the dual-band FM box *and* a VHF 100 watt linear amplifier all at once — from each of these supplies in turn. Both supplies coped nonchalantly with such a load, even when we keyed both transmitters at once, to take the supplies to their rated peak output. Silent, efficient and no-fuss power...

All of the Emtron switch-mode supplies have automatic input voltage selection, will run from either 50 or 60Hz mains, have built-in RF suppression components, and self-resetting short circuit protection for indefinite duration. The EPS-20 has current limiting at 17A. The EPS-40 has current limiting at 36A. Both have thermal, indefinite short circuit and over-current protection. The over-voltage protection at 16V uses a 'crow-bar'. Both are certified to international standards: IEC950 for safety and EN55011 Class B for EMI, and are European CE approved. Additionally, each has slow-blow fuse protection on the AC input.

Size-wise, the EPS-20s measures 320 x 185 x 70 (mm, dwh) and weighs 2kg. The EPS-40 is 320 x 185 x 140 (mm, dwh) and weighs 3.5kg. The EPS-40R is 320 x 185 x 140 (mm, dwh), with 19" rack-mount fittings, and weighs 6kg.

As an aside, some old-timers have a healthy concern about relying on switch-mode supplies, and the fears *were* well-founded, with some early units proving unreliable, expensive to fix, and noisy from an RF point of view. But these days, neither reliability nor noise should prove major concerns. In fact, if you have an HF transceiver with an inbuilt power supply, it's more than likely to be a switch-mode supply, and we've not complained about any of them in recent years...

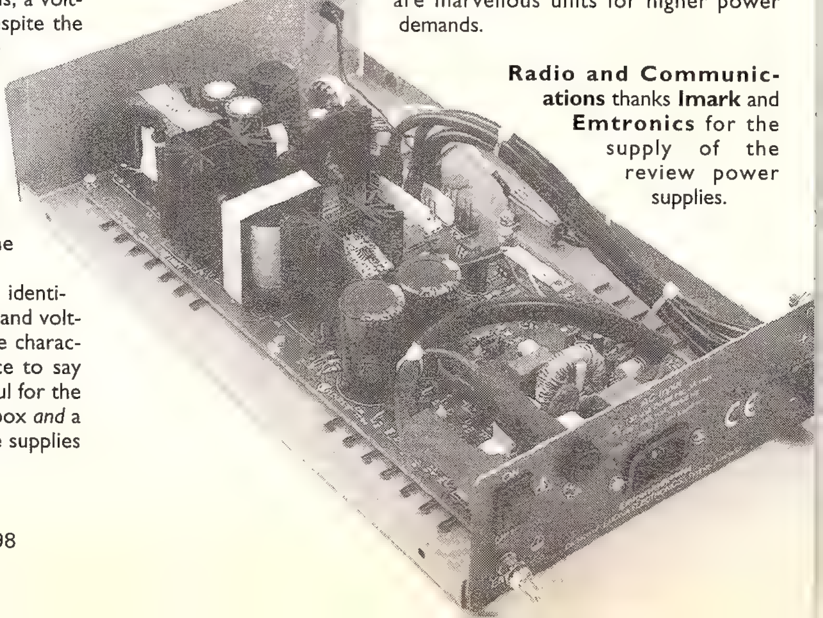
Emtronics also manufactures a large and heavy 30A bench supply of a traditional linear design. We looked at this unit, too, and must conclude that, while it is of amazing quality and stability, few operators would ever push it to anything like its limits. What's more, the EPS-40 costs less!

Overall, then, the construction of the Emtron supplies is of a good standard with safety, reliability and longevity being definite hallmarks.

## *Summary*

Five power supplies, all locally made with definite stamps of quality. The small Imark units are winners in the small equipment, conventional supply class and the three Emtron units are marvellous units for higher power demands.

**Radio and Communications** thanks **Imark** and **Emtronics** for the supply of the review power supplies.



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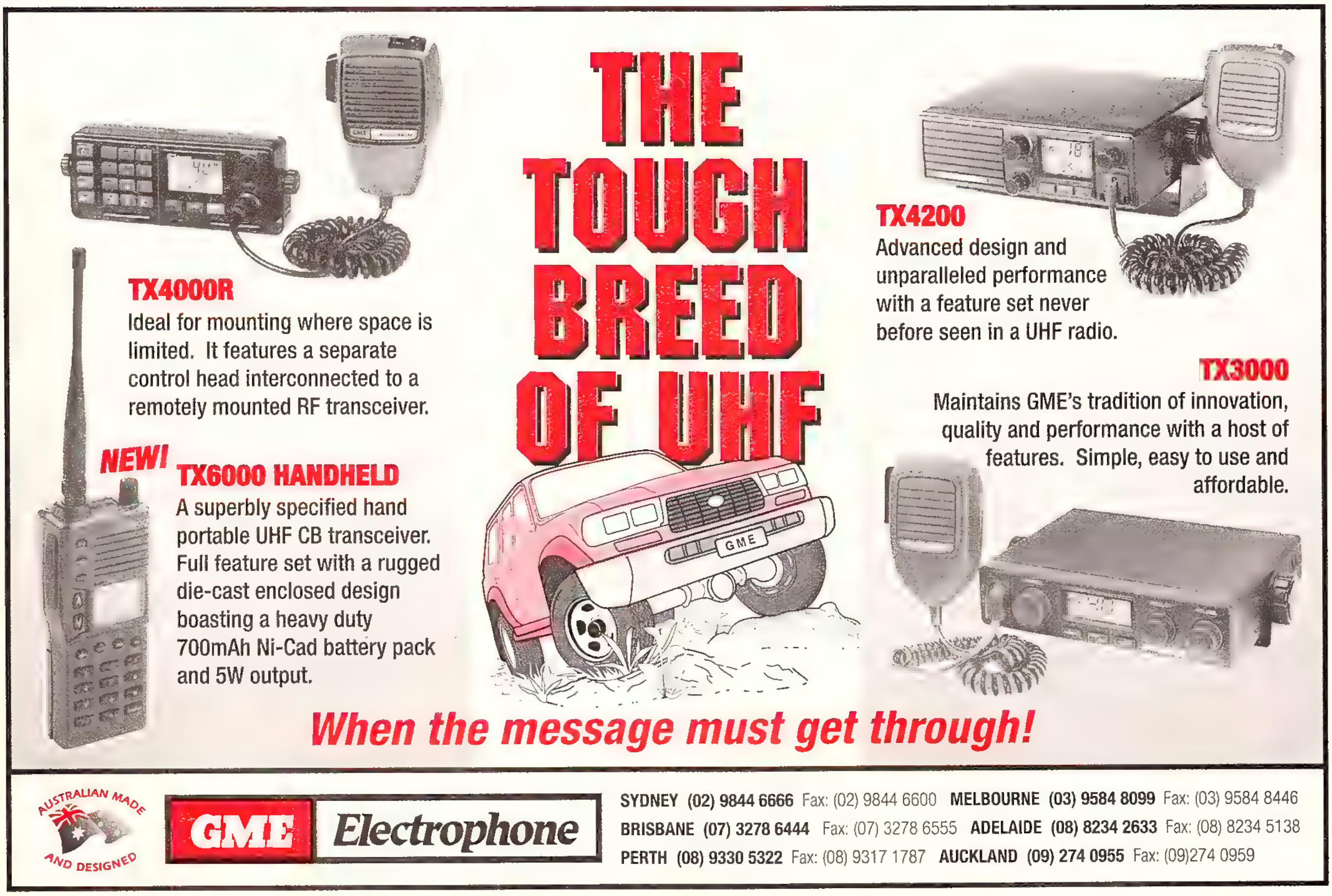
*The winner's name will be announced in the March 1998 issue of your favourite radio mag. (Of course, that's this mag...)*

*Note that chance plays no part in determining the winner, and the Editor's decision is final.*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# The Listening Post,

...compiled by Michael Evans...michael@tbsa.com.au...

Welcome to another year, fellow recreational scanner enthusiasts. I trust Christmas was a safe and happy one for you and your families. 1998 is going to be an interesting year in the radio monitoring world, with many of our law enforcement agencies in this country looking to go digital. More on that a little later...

## The mailbag...

First off this month I'm going to dive into the mailbag again as a swag of mail has come in recently, prompted by items that I have mentioned in previous months.

• **Graham from Port Melbourne** and **Kevin from Reservoir** have both written in requesting information about the police districts in metropolitan Melbourne, and their corresponding channel numbers. A complete list if shown opposite.

• **Jason from Bankstown** in NSW has asked about the frequencies used by Alitalia Airlines for Victoria and New South Wales. According to my information they use an airband frequency of 131.900 MHz in AM mode, and a company channel of 467.025 MHz in Sydney and 466.625 MHz at Tullamarine in Melbourne.

• **Kevin in Mackay** has written to me wanting the frequencies that are used by his local council, and in his letter he states that they appear to use radio as well for equipment control. Scanning the records, Kevin, I have come up with a voice channel of 79.540 MHz and data channels of 471.225 MHz, 471.400 MHz, 450.025 MHz and 464.900 MHz. I hope that helps you out, Kevin.

• I have had a lot of people wanting to know the frequencies in use in the various **Coles Supermarkets** and **Kmart** stores across Australia now as they appear to be using mobile telephone styles of intercoms for obtaining price information from the staff on the floor. The database shows a frequency of 921.500 MHz as being the one that appears to be being used right across the country. Happy listening to that one.

• On a similar vein, a few people have written wanting to know the type of system in use in the **Kmart** stores for their hand-held data scanning devices in use. I don't have any information on the data format itself, but the frequency to hear all of the blips and blurbs on is 859.000 MHz. I understand it's digital data...

• Let's head over west to Adelaide where Harry wants to know the channels used at the **Adelaide Convention Centre**. Tap in 488.250 MHz, 486.825 and 487.500 MHz to hear its day-to-day activities.

• Still in lovely Adelaide, James has asked for the frequencies for the **Adelaide Entertainment Centre**. The ones actually licensed to the centre itself are 467.025, 469.550, 469.725, 469.925 and 472.000 MHz. Due to the nature of the venue, there will be a number of other frequencies that pop up their from time to time for the numerous concerts and events held there, but these will be a good starting point.

## Police to go Digital?

I mentioned earlier about the possibility of our emergency services making a move over onto a national digital network. Back in June and July of 1997 the emergency services all gathered in Sydney for a display of TETRA (Trans-European Trunked Radio) which has been adopted across Europe at a great rate of knots.

The results were impressive, and all concerned expressed a great deal of interest in what the system has to offer. For a long time the ability of the criminal element of society to monitor the activities of the Police has been a major concern to every state and federal law enforcement agency of this country. The idea of a digital system makes it so much harder for people outside of the authorised radio network to listen to what is happening on the air.

Being a digital system, the technical specifications are complex and numerous, however some basics of the systems can be easily explained. The modulation type used by TETRA is called DQPSK (Differential Quadrature Phase Shift Keying) and allows for two bidirectional bits to be sent at the same time. This data rate is sent out at 18,000 bits per second, but due to the ability to send two bits bidirectional, the effective rate can be 36,000 bits. With this high-speed data transmission the system allows for four separate users to utilise one frequency at exactly the same time. This is achieved by high-speed time sharing where each user is given 20 milliseconds to send or receive information. This is a similar system to the digital GSM telephone system.

Each data burst is 0.06 seconds in length, and the four slots don't always carry the voice signal in a digital format. It also sends the channel information, radio status and other vital network information to all of the radios online.

A TETRA radio network utilises three control channels per system. The first control channel (called fast) is the one used by the mobiles to log into the system and for the channel allocations. The broadcast control channel is the one used to constantly send out the information relating to the base site itself and the channel plan it uses together with information pertaining to the closest base stations to it. This channel can be identified by the casual listener very easily by the 2.25 kHz tone bursts which encourage the mobile radios computers to sync up with the base station correctly. The last control channel is known as the slow channel and is used by the base station to tell the mobiles that other mobiles are attempting to set up a communication with them.

To the best of my knowledge there is not a full-blown TETRA system running in Australia yet; this, however, is not 'Science Fiction Stuff'! As discussed a couple of months ago by Chris, VK3CE, Simoco Pacific Networks is making big inroads in this country with its TETRA products, and the emergency services are very interested to say the least. There is no doubt that digital communications is the only way to go for our emergency services, in the future definitely — as to how *far* in the future I guess we will know more throughout this coming year...

Will TETRA mean the end of the casual scanner hobbyist listener? In truth, the short answer is probably yes. However with that said, many scoffed at the idea of being able to decode MPT 1327 and Motorola SmartNet Trunking systems, and look at the inroads that have been made on those fronts. Digital reception scanners will no doubt become available as this technology creeps into the commercial marketplace on a greater scale. With these networks a reality across much of Europe today, I guess the clever people of this world will be busily designing such a scanner as you are reading this, so let's keep our fingers crossed for Australia.

Well, gang, that's it for another month of listening pleasure. If you want to send me an email on the internet address your mail to michael@tbsa.com.au.

**Some of the frequencies in this article have been obtained from the official Australian Communication Agencies AFAD database, Copyright ©1998 Commonwealth of Australia**

| District | Division | Channel | Town/suburb |
|---|---|---|---|
| J | 1 | 66 | Altona North |
| K | 1 | 72 | Anglesea |
| G | 2 | 60 | Ashburton |
| I | 1 | 65 | Avondale Heights |
| J | 2 | 66 | Bacchus Marsh |
| G | 2 | 60 | Balwyn |
| K | 2 | 72 | Bannockburn |
| K | 1 | 72 | Barwon Heads |
| F | 2 | 68 | Bayswater |
| C | 1 | 71 | Beaumaris |
| F | 2 | 68 | Belgrave |
| C | 2 | 71 | Bentleigh |
| C | 1 | 71 | Bentleigh East |
| E | 1 | 69 | Berwick |
| G | 1 | 60 | Box Hill |
| C | 2 | 71 | Brighton |
| I | 1 | 65 | Broadmeadows |
| I | 2 | 65 | Brunswick |
| E | 1 | 69 | Bunyip |
| G | 2 | 60 | Camberwell |
| I | 1 | 65 | Campbellfield |
| A | 2 | 36 | Carlton |
| C | 2 | 71 | Caulfield |
| D | 2 | 70 | Chelsea |
| C | 1 | 71 | Cheltenham |
| A | 2 | 36 | City West |
| C | 1 | 71 | Clayton |
| I | 2 | 65 | Coburg |
| A | 2 | 36 | Collingwood |
| K | 2 | 72 | Corio |
| E | 2 | 69 | Cowes |
| I | 1 | 65 | Craigieburn |
| E | 2 | 69 | Cranbourne |
| F | 1 | 68 | Croydon |
| E | 1 | 69 | Dandenong |
| H | 2 | 67 | Diamond Creek |
| G | 2 | 60 | Doncaster |
| E | 1 | 69 | Doveton |
| D | 1 | 70 | Dromana |
| K | 1 | 72 | Drysdale |
| A | 1 | 36 | East Melbourne |
| C | 2 | 71 | Elsternwick |
| H | 2 | 67 | Eltham |
| B | 1 | 06 | Elwood |
| F | 2 | 68 | Emerald |
| H | 2 | 67 | Epping |
| F | 2 | 68 | Ferntree Gully |
| A | 2 | 36 | Fitzroy |
| I | 2 | 65 | Flemington |
| J | 1 | 66 | Footscray |
| D | 1 | 70 | Frankston |
| K | 1 | 72 | Geelong |
| I | 1 | 65 | Gisborne |
| G | 1 | 60 | Glen Waverley |
| C | 2 | 71 | Glenhuntly |
| H | 2 | 67 | Greensborough |
| D | 1 | 70 | Hastings |
| G | 2 | 60 | Hawthorn |
| F | 1 | 68 | Healesville |
| H | 1 | 67 | Heidelberg |
| H | 1 | 67 | Heidelberg West |
| H | 2 | 67 | Hurstbridge |
| K | 2 | 72 | Inverleigh |
| G | 2 | 60 | Kew |
| J | 1 | 66 | Kingsville |
| E | 2 | 69 | Koo Wee Rup |
| E | 2 | 69 | Lang Lang |
| K | 2 | 72 | Lara |
| J | 2 | 66 | Laverton |
| F | 1 | 68 | Lilydale |
| K | 1 | 72 | Lorne |
| I | 1 | 65 | Macedon |
| J | 2 | 66 | Maidstone |
| C | 2 | 71 | Malvern |
| J | 2 | 66 | Melton |
| K | 2 | 72 | Meredith |
| F | 2 | 68 | Monbulk |
| I | 2 | 65 | Moonee Ponds |
| C | 1 | 71 | Moorabbin |
| F | 1 | 68 | Mooroolbark |
| D | 2 | 70 | Mordialloc |
| D | 1 | 70 | Mornington |
| F | 1 | 68 | Mt Evelyn |
| G | 1 | 60 | Mt Waverley |
| C | 2 | 71 | Murrumbeena |
| J | 1 | 66 | Newport |
| H | 1 | 67 | Northcote |
| G | 1 | 60 | Nunawading |
| C | 1 | 71 | Oakleigh |
| K | 1 | 72 | Ocean Grove |
| F | 2 | 68 | Olinda |
| E | 1 | 69 | Pakenham |
| B | 2 | 06 | Port Melbourne |
| K | 1 | 72 | Portarlington |
| B | 1 | 06 | Prahran |
| H | 1 | 67 | Preston |
| H | 1 | 67 | Preston East |
| K | 1 | 72 | Queenscliff |
| A | 1 | 36 | Richmond |
| I | 1 | 65 | Riddells Creek |
| F | 2 | 68 | Ringwood |
| D | 1 | 70 | Rosebud |
| A | 2 | 36 | Royal Park |
| A | 1 | 36 | Russell Street |
| D | 1 | 70 | Rye |
| E | 2 | 69 | San Remo |
| C | 1 | 71 | Sandringham |
| D | 1 | 70 | Seaford |
| D | 1 | 70 | Sorrento |
| B | 2 | 06 | South Melbourne |
| D | 2 | 70 | Springvale |
| I | 1 | 65 | St Albans |
| B | 1 | 06 | St Kilda |
| B | 2 | 06 | St Kilda Road |
| I | 1 | 65 | Sunbury |
| J | 2 | 66 | Sunshine |
| H | 2 | 67 | Thomastown |
| K | 1 | 72 | Torquay |
| A | 2 | 36 | Victoria Dock |
| F | 1 | 68 | Warburton |
| J | 2 | 66 | Werribee |
| I | 1 | 65 | Westmeadows |
| H | 2 | 67 | Whittlesea |
| J | 1 | 66 | Williamstown |
| K | 1 | 72 | Winchelsea |
| E | 2 | 69 | Wonthaggi |
| F | 1 | 68 | Yarra Glen |
| F | 1 | 68 | Yarra Junction |
| J | 1 | 66 | Yarraville |

To help make a little more sense of all that, remember that the standard UHF channel allocations in Victoria cover channels 1 to 64 sequentially from 467.850 through to 469.425 MHz. Channels 65 to 72 are voting groups:

Channel 65: ch 13, 15 & 63
Channel 66: ch 40, 41 & 62
Channel 67: ch 43, 55 & 56
Channel 68: ch 17, 19, 21, 44 & 60
Channel 69: ch 59, 61 & 64
Channel 70: ch 27, 34 & 42
Channel 71: ch 14 & 28
Channel 72: ch 35, 37, 49, 50 & 51

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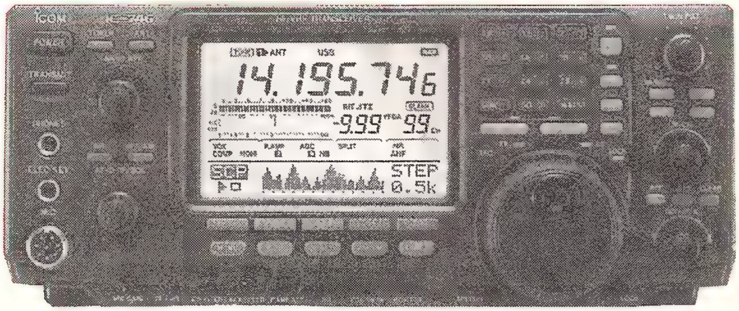

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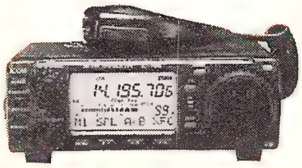

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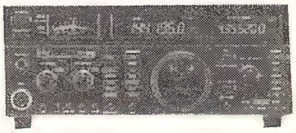

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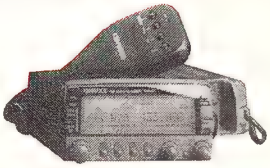

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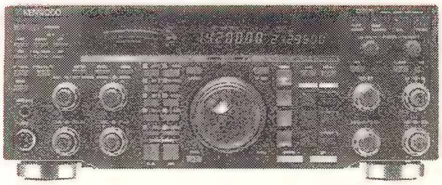

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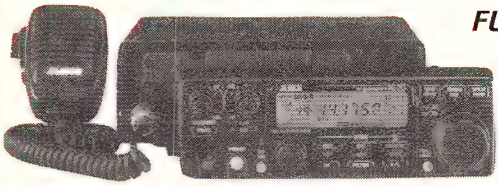

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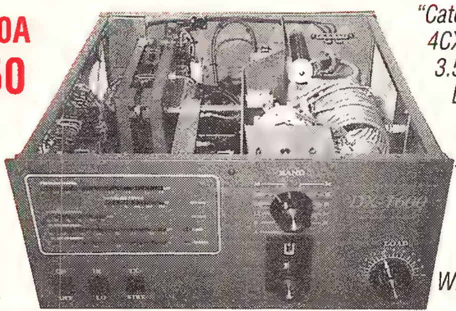

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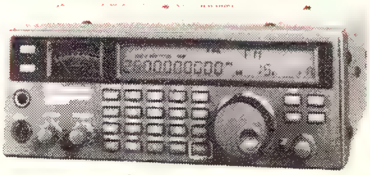

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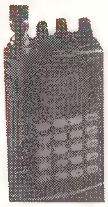

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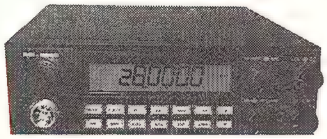

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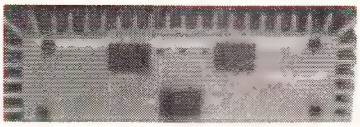

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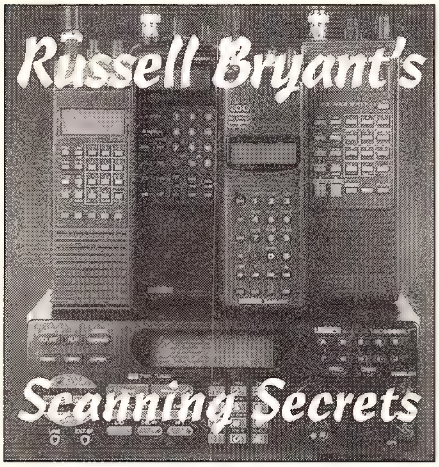

## This month's topic:
## Buying second-hand scanners

Of the four scanning radio receivers I own, only one was purchased new. All the rest were owned by someone else before coming into my possession. In short, they were second-hand.

While some enthusiasts shy away from buying used scanners, occasionally with good reason, a bargain can be had if you know what to look for and are able to identify the tell-tales signs of potential trouble. The reasons for hobbyists rejecting pre-loved equipment outright are many and varied, however the main excuse is because they have at some stage, been lumbered with a lemon. Good money lost — money that *could* have been spent on the part purchase of a new scanner. I've been in that situation myself. Why? First of all, I allowed my desires or heart to rule my brain. Because I wanted that particular radio, I forget to run through the check list of do's and don'ts of buying a second-hand scanner. Never again!

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Before going further, a word of warning — there is no magic formula to buying second-hand, no special way of telling whether the scanner you have your eye on has been fiddled with, or is in fact a genuine windfall on offer. But, with a little common sense, as well as the application of the following rules, there should be no reason for not buying a used scanner.

Scanners such as the early Electra Bearcats (pre-Uniden takeover of the Bearcat label), have been available in Australia for over 20 years — they are, simply, getting a little tired. Models such as BC210, BC20/20, BC220 and BC250 were the mainstay of monitoring during the early- to mid-1970s. Unless one of the scanners nominated was in exceptionally good condition, both physically and electrically, I would be reluctant to spend any money whatever on it. Mainly because when something *does* go wrong — and, believe me, it will, about five minutes after you get it home — the cost of repairs, together with the price of the necessary parts if available, will total more than the value of the radio.

Naturally enough, if you are a dab hand with a soldering iron, there can be considerable pleasure gained from rebuilding one of these dinosaurs of the scanner world to working order. There's no doubt that, as these relics of the past become less and less valuable to the seller, they will increasingly gain collectors' items status. A good working model may become a valuable asset.

Way back in the early days of the hobby, when I and a few of my friends had more hair and less stomach, crystal-locked scanners were the go. These units gave rock solid (pardon the pun) service, especially as most of us had 'cut our teeth' on tunable radios which often measured drift in terms of MegaHertz rather that kiloHertz! Today, however, I wouldn't touch a crystal scanner with the proverbial barge pole, with one qualification: if, and *only* if I had a generous supply of crystals cut for the radio in question, not to mention the users I wished to listen in on. Only then would I contemplate a crystal-controlled scanner. On the second-hand market, I very much doubt that it would be possible to give away a crystal-locked receiver. This makes the proposition of spending around $30 for each crystal somewhat strained. In brief don't bother with them.

Let's now examine the ways and means of buying a used programmable scanner that is, for the sake of the argument, less than 10 years old. Never judge a book by its cover, the old saying goes, and perhaps that's okay if you are into buying used books. However, when it comes to acquiring second-hand scanners, appearance may be the first sign of a bargain or alternatively something being amiss.

A comparatively unmarked case could indicate that the scanner has not been dropped, used in a mobile environment, or subject to some other form of abuse. I suppose this is where heeding the old proverb may come in handy, as almost all importers and suppliers of scanning radio equipment also stock spare parts.

Front panels along with top and bottom cases can be purchased as spares thereby replacing the existing panel or case, to provide an instant face lift. In other words, to quote another popular saying, they may be making a silk purse out of a sow's ear by giving a hard-worked piece a few new bits! This method of dressing up an older model scanner may be camouflaging more than just normal external wear and tear, and is possibly hiding years of mistreatment.

However, as a buyer in a hurry, you may be deluded by the 'as new' appearance of your prospective purchase. After all, it looks okay on the outside, and then there's the box and manual and everything, so it'll be fine. So your heart rules your brain, and your hand passes the cash to the vendor, who can barely contain his joy. You may not realise it but you have just bought a clunker!

Back in the shack you plug in this latent nightmare — sure the display shows the frequency, it programs up without a hitch, but something just doesn't seem right. It doesn't take long for the penny, or should I say — several hundred dollars — to drop. Nothing is coming out of the speaker! A tweak of the squelch control reveals that familiar rushing sound of unmuted FM, so the speaker's okay. Maybe the aerial's not connected properly, or the service you are trying to monitor is having a quiet day? Every excuse is used in an attempt to delay the inevitable conclusion — this thing is stuffed.

Ever so slightly annoyed about this, you telephone the individual who happily took your money, seeking a refund. His mother informs you that he has gone away on holidays — no doubt on your money — and won't be home for two weeks. Patiently you wait, plotting his demise. The fortnight passes and you finally make contact with this purveyor of junk. He fundamentally dismisses your complaint with the words "...It was working fine when I had it. You must have buggered it, mate! It's your problem now..." You question whether his parents were married at the time of his birth and hang up, thoroughly disgusted with the human race.

### Avoiding the disasters...

A few minutes of your time could have avoided this scenario. First and foremost, have the vendor plug the scanner in or power it up just to make sure it's working. If it passes this test, have him program a few frequencies into memory, make sure he tries a couple of the low power variety rather than the powerhouse local police channels. If it is a wide band receiver such as an AOR AR8000, Yupiteru or Icom, make sure frequencies from as many bands as possible are checked.

Maybe it would be wise to adapt that rule to *every* scanner, because the band plan in Australia is different to the one used in the United States. Therefore a scanner that receives the American 30 MHz band is of pretty limited value here. Basically, make sure that the model you are considering buying has the frequencies you need.

When the seller is demonstrating the scanner, connect it to an external aerial of possible. As well, ask if a telescoping whip (or rubber duckie aerial if a hand held) is available. Try the same reception test with the radio connected to either one of these. While a reduction in performance is to be expected, some of the power stations around the place will still be heard.

Time to delve deeper!

Satisfied that the scanner covers the Australian frequencies and that it receives on all bands, on an outside whip as well as set-mounted antenna, ask to see its insides. In all fairness, this may not be possible on some models of scanners, especially portables, so don't push the point too hard. Additionally, some sellers won't be happy about disassembling their scanners. In reality, you may a hear a few expletives that you have never heard before, so if this is the case, the decision rest with you the buyer, as to whether or not the scanner goes home to your place or if it stays put.

Assuming of course the vendor is happy to show you his radio's internals, check for anything that indicates a repair job. When I was doing electronics at tech, my instructor once told me that a good radio technician possessed three attributes: good eyes, a good nose and the ability to feel.

Look for soldering that doesn't fit in with the rest of the board. Look for a flash or burn mark either on the printed circuit board or the lids. Look for a component that maybe discoloured or, in the case of an electrolytic capacitor, that appears to have 'popped'. These things can leak electrolytes which may cause damage to copper tracks and component wires.

The odour of a burning or burned-out electrical component is one that can never be mistaken, so stick your nose in and smell, as anything that may have self-immolated will be obvious.

Before sticking your fingers in for a feel around, remember that some components get hot as part of their normal operating condition, so unless you are experienced in the ways of radio circuits, the touch test can be dispensed with

If, on the other hand you know what to feel for, check for excessive heat radiating from within.

If any or all of these tests reveal a problem, then tread carefully because the scanner may be in need of attention. Reversed polarity, old age and voltage over-supply are the usual reasons for component failure.

Harking back to the mismatched soldering, don't always assume that component changes have always been performed by a back yard technician armed with a screwdriver and little else. Sometimes a refurbished radio will behave like new, because all work has been carried out by a factory-authorised technician, who will under most circumstances guarantee his efforts.

The story so far! On offer is the XYZ super scanner with double over-head discriminators. Externally, it looks good — very good — in fact, there's not a mark on the thing. The inside are like new. It's clear that no one has fiddled with this baby. Programmed up with a dozen or so frequencies from across the RF spectrum it purrs like a kitten. In short, it's a genuine bargain. When you quiz the seller about price he nominates an amount which is about $100 over the going market value for this model.

Why? It has the box — yes the radio has the *original box*! Well, I am here to tell you, no scanner box is worth $100 — not even *ten* dollars. In fact, the box should really add *nothing* to the value of a radio, but in the real world it *does* add something, so be wary of vendors who over-value a radio — be it a scanner, CB or whatever — because it has the original carton.

What *should* add value to a scanner — to a small extent at least — are things like the operating manual, original aerial, power cables, mounting cradles, carry cases and additional battery packs or aerials. Once again, be careful that you don't pay more for something used that you would if it was new!

In conclusion, the second-hand scanner market is not a place to be afraid of. Bargains can be had, if you simply apply a good amount of cautious optimism and don't let your emotions over-ride common sense. Remember, scanners sold privately rarely, if ever, come with guarantee, and seldom can they be returned if they malfunction.

That's it for January. Happy New Year to you all! Any correspondence should be accompanied by a stamped, self-addressed envelope. The address, as always, is Russell Bryant, PO Box 344, Springwood, NSW 2777

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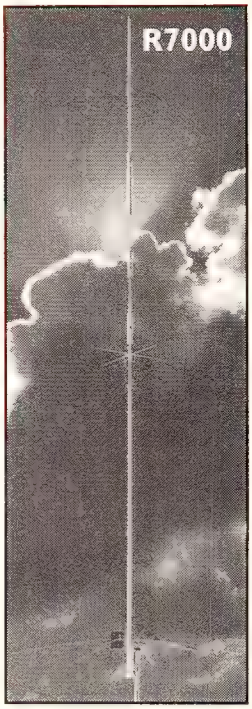

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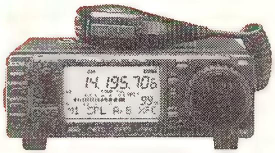
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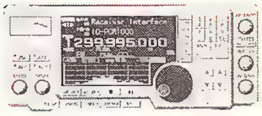
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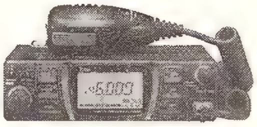
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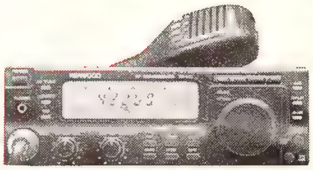
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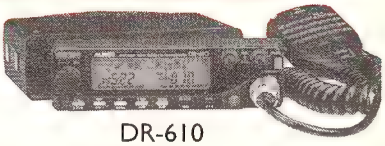
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# Magellan GPS-2000XL

## Worthwhile upgrade for a popular GPS unit...

By Ken Reynolds

Ten years ago the American 'Star Wars' Global Positioning System (GPS) was still a bit of a novelty to most, however in 1997 a large portion of the population have now been touched in some way by its might.

At the time of GPS' entry to the consumer market the cost of a hand held receiver was almost prohibitive — around $2,000 — but as with most new technologies, mass production of custom integrated componentry quickly drives down the outlay of owning your own unit resulting in a simple to use, excellent product like the Magellan GPS 2000XL Satellite Navigator.

Magellan was an early contender in the competition for your GPS dollar, and produced the world's first commercial hand-held GPS receiver in 1989.

The descendants of that product are supplied in Australia, complete with Australian warranties, by the network of Woolworths-owned Dick Smith Electronics stores. We reviewed the original Magellan GPS 2000 almost two years ago, and revelled in the simplicity of the technology as presented to the user.

The GPS 2000XL comes complete with a carry case and wrist strap and, apart from the comprehensive manual, its box also contains a quick reference guide to the unit's functions.

There are several Magellan GPS hand-held models available from DSE, but this review is about the newest, most basic model — the GPS 2000XL.

First seen in late 1995 and introduced as the GPS 2000, the model has now been updated to the XL, or mark II version for 1998. It includes not only technical improvements to performance but a valuable reduction in power consumption which extends the operating life from about 17 hours on one set of four AA alkaline cells in the old model up to 24 hours continuous operation in the new XL model.

The GPS 2000XL, while not quite as compact as its equivalent rival, the Garmin GPS-38 personal navigator, is a convenient pocket-sized package which weighs in at 202 grams unloaded and about 294 grams including a set of four AA-size alkaline cells. It measures 167mm long by 58mm wide and 33mm thick, and has a large LCD window measuring 46mm by 36mm wide. The black plastic case is claimed to have waterproof construction and the unit can operate over a voltage range of 10 to 16 volts when used with the optional external power module. Current drain from the four AA cells is 80mA without back lighting and increases to 145mA with the lights turned on.

The GPS 2000XL updates displayed information at a rate of once per second on a continuous basis and, unlike some similar competitive units, it functions at over 1500 km/h with a maximum altitude of 17,500 metres. Its positional accuracy is claimed to be about 15 metres, and relative speed accuracy to 0.1 knot under constant speed, controlled conditions.

While all this capability of the GPS 2000XL is very impressive in itself, it seems unlikely that many of its users will ever travel at any speed in excess Mach One... but it's nice to know the capability is at your disposal! In our case, the maximum speed involved in the evaluation was about 100km/h and the minimum speed encountered about 5km/h — walking.

### Getting started...

Like most new, out-of-the-box hand-held GPS units, the GPS 2000XL memory is a blank matrix waiting to absorb information which is entered during the initialising process. To get the instrument up and running in double-quick time, after turn-on, the Magellan display will prompt the user to enter some local information from its initialise display screen. The display takes the operator through a series of steps to set the approximate latitude and longitude (simply, by displaying a world map and asking roughly where you are), and the correct date and time. From this information the instrument is able to acquire a fix most easily — apart from when directly entering an exact set of data.

The unit can also be initialised the easy-lazy way by just turning on the power and waiting in a suitable location for self initialisation whereby the receiver eventually calculates its own location position from the raw satellite data — this may take up to 15 minutes, or even longer for a cleared data memory.

The GPS will hold data in its memory indefinitely while power is connected, however with the power removed for more than about 20 minutes all data may be lost and the unit will need to be re-initialised.

A status page graphically portrays the number of satellites available, their relative positions and a bargraph representation indicates signal strengths of each acquired bird. This page can be accessed at any time without affecting other functions. The GPS 2000XL employs a sophisticated 12-channel tracking system to produce fast and accurate data, however most of the time we only seem to have access to around eight satellites — which has nothing to do with any deficiency of the receiver.

Once initialised, most of the other parameters may be customised to suit the user. For example, the SETUP menu offers the options of selecting a desired co-ordinate system from a list of Latitude and Longitude, the most popular and familiar system, or UTM, the Universal Trans Mercator, a system based on lines projected onto a 'flattened' sector of

....☞

# Magellan GPS 2000XL

the earth's surface rather than projected onto a globe. These sections of the Earth's surface are known as zones and are based on six degree segments projected from the earth's centre.

Other systems included in the Magellan are similar to the UTM configuration but are based on specific localities like OSGB for Great Britain and so on for Irish Grid, Finnish Grid, Swedish Grid and Swiss Grid systems.

Elevation can be set for two or three dimensional navigation with a choice of metres or feet as the units of height. Choice of speed units is from knots, MPH or km/h, and distance units are statute miles, nautical miles or kilometres. Finally, the GPS 2000XL permits bearings referenced to magnetic or true north... whatever your fancy.

The setup is so simple and such common sense that many users could do it quite well without the handbook once some of the LCD abbreviations are recognised. In fact, this is not the recommended procedure but is probably the most common!

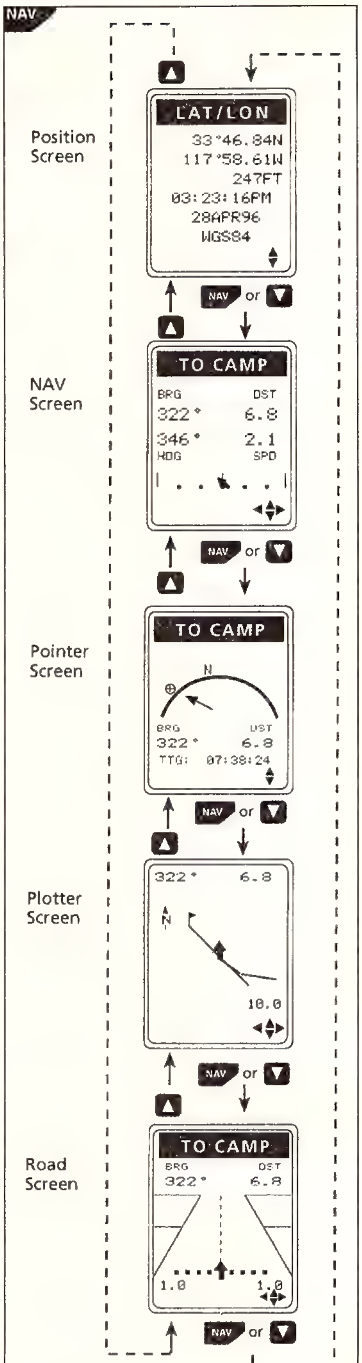


Figure 1

## Simple functions

While serious navigation is made easy by the Magellan, there are many simple functions that may be executed with only the most basic knowledge of the instrument.

Once the unit is calibrated to the user's requirements and the NAV (for navigation) button pressed, a series of user-friendly graphic screens of information will be presented sequentially by using the up and down arrow buttons for selection. All the user needs to take a 'fix' in the NAV mode is press the ENTER button, which then prepares the unit to store the current position in one of several ways selected on screen by the arrow keys. Name the memory position using the alphanumeric menu again by manipulation of the arrow buttons, or just use the LMK (LandMarK) selector whereby the instrument allocates a numeric label to the 'fix' and adds to it to the consecutively-numbered items in its list of up to 200 landmarks. A landmark can also be projected at a given distance and direction as required.

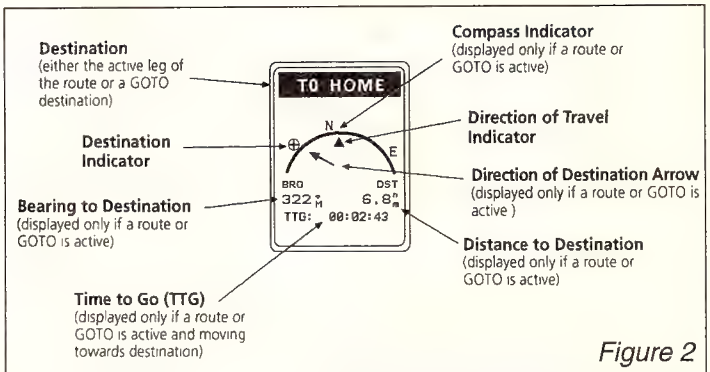

Destination
(either the active leg of the route or a GOTO destination)
Destination Indicator
Bearing to Destination
(displayed only if a route or GOTO is active)
Time to Go (TTG)
(displayed only if a route or GOTO is active and moving towards destination)
TO HOME
N
E
BRG DST
322° 6.8
TTG: 00:02:43
Compass Indicator
(displayed only if a route or GOTO is active)
Direction of Travel Indicator
Direction of Destination Arrow
(displayed only if a route or GOTO is active )
Distance to Destination
(displayed only if a route or GOTO is active)

Figure 2

To set a course to any of the stored positions, all the user needs do is press GOTO and select the desired location from the displayed lists of positions and then press ENTER to execute the function. The GPS will then calculate a bearing, heading and distance referred to the selected target and from its calculated speed it will even estimate an en-route time.

An odometer feature is also included to augment the indicated direct as-the-crow-flies distance from the target. The odometer keeps track of the actual distance travelled. For example, I carried the GPS 2000XL with me on an island bushwalk in Queensland where the furthest distance from base was 4.7 kilometres but the actual direct distance was only 3.2 kilometres.

The Magellan automatically saves a fix every 10 minutes of operation and stores up to 21 sets of data in a memory named the last fix buffer. When the buffer is full, each new fix is added to the top of the list of 21 last fixes and the oldest data is dropped off the bottom. While this might appear to be a handy information that can be accessed at any time, it really becomes valuable as a data trail for the BackTrack function which enables one to retrace the route covered up to and including the last 21 fixes. An invaluable feature for users prone to getting lost...

A more advanced feature is the ability to save a series of routes for later use or reference. To construct and save a single step route is the beginning of the route learning curve... and really quite simple to do. Once a few landmarks have been saved the basic requirements for route making are available. Simple press the GOTO button and highlight the ROUTE option in the menu by using the up/down arrows and press ENTER and a list of existing routes will be displayed.

An existing route may be selected by highlighting the desired route and accepting that selection by pressing ENTER. If no existing route exists, the screen will prompt the user to create a new route by selecting data from already stored information and then entering these points to produce a new route. When the numbered registers contain no data they are each assigned a displayed EMPTY tag.

The GPS 2000XL can create and store up to five multi-leg routes using any of the landmarks in memory and having up to 20 legs in each route. To produce a multi-leg route simply enter the Routes Menu and use the left and right arrows to select the desired landmarks from the lists, then enter each point in turn until the selected route has been constructed. The display will indicate the number of legs as each point is subsequently entered. When the routes menu list is full (five routes) any or all routes can be erased ready for storing a new sequence of navigational points. Routes once saved can be reversed or edited if necessary.

There are five different screens of information available for use in the NAVigation mode. **Figure 1** shows the sequence of appearance as they are stepped by the up and down arrow buttons. There are many other functions and features too numerous to list here, however most of them use various permutations of the operations already outlined.

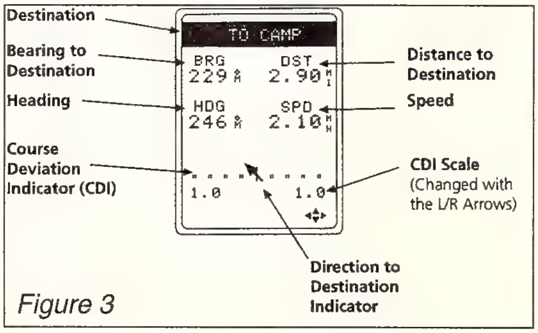


Figure 3

## How it performs — on the road and track

The Magellan GPS 2000XL is mainly intended as a pocket navigation aid, and as such, it has no provision for connecting an external antenna (you need the next model up for this). The lack of an external antenna connector limits its value for a number of applications where the instrument is shaded from direct, wide-angle view of the sky.

By contrast, however, the receiver is sufficiently sensitive to often work quite well under what would be normally called unsuitable conditions, and is clearly much more sensitive than the outgoing model, the GPS 2000. For example, I could often get a 3D (three-dimensional) lock just wandering around inside my home (with a tiled roof) usually having acquisition of at least four satellites at considerable strength according to the signal strength bargraph. In fact, it was pretty tough to find a spot where the little GPS would lose 2D lock at all. Just resting on the desk in my study it could usually pick up five or six satellites with enough strength to maintain lock — at least according to the tiny LCD padlock icon which indicates the bolt open or closed respectively for out-of-lock and lock.

There is an optional cradle for the GPS 2000XL so that it can be used in more fixed applications — like in a car or boat. Since DSE did not supply one for the review the unit just 'sat' on the car dashboard and busily went about its task as if it were located in a proper cradle. It only momentarily lost 3D lock on several occasions when the orientation of the car roof obscured a couple of satellites for a short time. So with the GPS 2000XL, even just laying on the passenger seat of the car, acquisition of five or six satellites was the rule rather than the exception.

Walking along bushy tracks should have provided a real test for GPS 2000XL, but unfazed, the little mite grabbed satellite access through gaps in the foliage and, amazingly, produced fairly good continuity of data for about seven or eight kilometres of walking track.

All the navigational screens offer good, dynamic feedback on events but my favourite was the pointer screen (see **Figure 2**) which provides continuous instructions on which way to go from the direction of the pointer plus the bearing and calculated distance to the selected landmark. It also gives an estimated time of arrival based on current speed and direction. Of course it tends to give up on the ETA when you veer off in the wrong direction or continually vary your speed.

Even from Queensland, where the GPS 2000XL estimated I was 2,011 kilometres from home, it still managed to reckon accurately when it was only a few metres from its return destination. It did, however, estimate the ETA wrong by a couple of days thanks to a fancy trick played on it by Ansett Airlines...

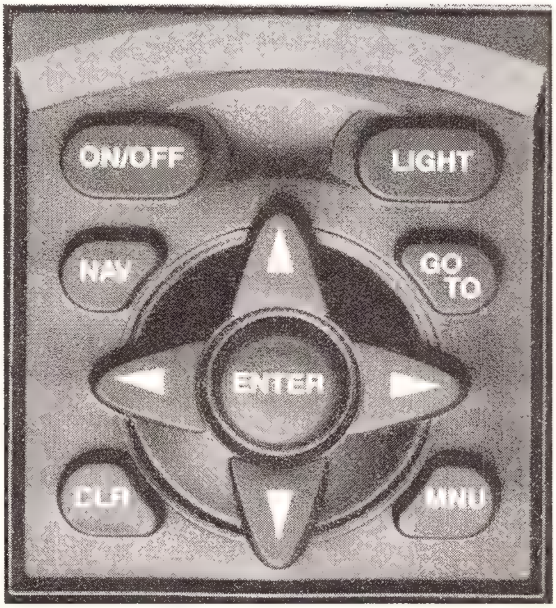
## Summary

At $450, the Magellan GPS 2000XL has a lot to offer, including the latest technology from the Magellan Systems Corporation in Sam Dimas, California, which is a leader in GPS technology.

The unit is simple to use, and offers accurate measurements under often quite poor satellite acquisition conditions. Long operating life from a single set of four AA-size alkaline cells is an important feature, especially for bush walkers where minimum weight is a prime requirement.

Teamed with the optional external power module, it will suit a wide range of applications — and even quite a few situations where this style of GPS with a built-in antenna only would not normally be considered.

Radio and Communications thanks Dick Smith Electronics for supplying the Magellan GPS 2000XL for review — and as a prize in this issue of R&C. Remember all you've just read, and turn to Page 27 for your chance to win the review unit!



## On the other hand...

### By Chris Edmondson, VK3CE

I reviewed the original GPS 2000 a couple of years ago, and while the newcomer looks very similar, I have to tell you the performance difference between the original and the newcomer is quite staggering. Those two years have been invested wisely...

The new case has a lot of rubber, on the base, and on the back and sides. Thanks to this, it will happily sit on the dash of your car while you drive. The earlier GPS 2000 had a hard plastic ridged back which was very slippery. The 11 front panel buttons are covered by a rubber membrane, and are in the same places as the earlier unit, but they have a more definite 'click' as the buttons are pushed.

We didn't try the 'dunk' test either, but we're assured the nitrogen-filled unit is waterproof.

The new receiver is FAR more sensitive than its older brother. With the two sitting side-by-side, the remarkable improvement in the newcomer's sensitivity was plain to see. Signals which were indicating 2 or 3 on the GPS 2000 were almost always a solid 9 on the GPS 2000XL, and while the GPS 2000 might have three satellites locked up at one time, the GPS 2000XL would more then likely have seven to nine of them. This is because it has a 12-channel parallel receiver, meaning it can listen to more satellites at the same time.

Where even small obstructions in the sky (small trees or nearby buildings) would eventually see the GPS 2000 lose a signal altogether, it took *concrete* buildings to finally overcome the GPS 2000XL. It maintained a 2D lock with adequate signals deep inside my house when the GPS 2000 couldn't hear a thing. Not a skerrick...

The alphanumeric screens are significantly different, too. Where the GPS 2000 had a greenish-coloured backlit display, the newbie has a traditional screen which is much clearer from most angles. As well, its backlight is considerably brighter, and the screen can be read over a wider range of angles.

After the GPS 2000 first hit the market, one or two fairly major software upgrades were incorporated in the receiver without any obvious external indications. To be perfectly honest, I cannot remember which of the many features were added later, but take my word for it, the last version of the GPS 2000 did just about everything you could expect from a GPS receiver, and more. It even told you the sunrise and sunset times for your point on the globe, and showed the cycles of the moon. The only thing it couldn't do was find the fish for you!

As far as I can make out, from the user's point of view the new receiver works in almost exactly the same way as the last version of the GPS 2000. It offers all the features of the GPS 2000, and displays them in the same order.

The Magellan range of GPS receivers and plotters is extensive, with units for aviation, marine and land-based services, including some pretty upmarket equipment with full screens, map displays, plotters and the works. The range is imported by Magellan GPS Systems Australia in Perth, and carries a full Australian warranty.

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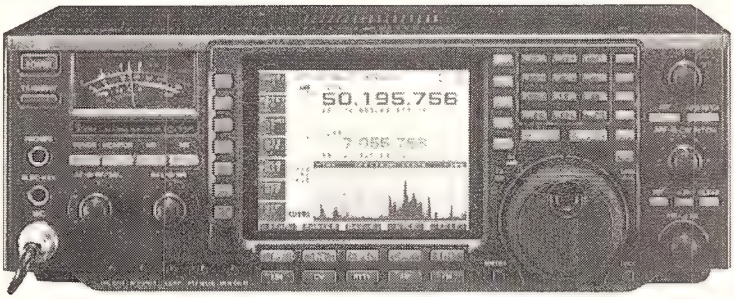

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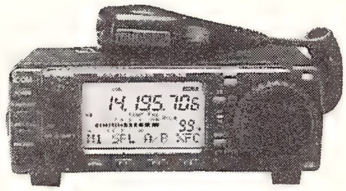

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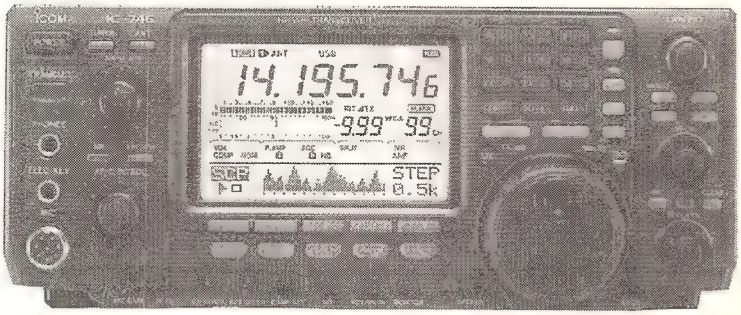

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# Maldol LP1300 Log Periodic Yagi

## A *directional* wide-band scanning antenna

By Russell Bryant

While the discone is a good wide-band general purpose antenna, it lacks two important characteristics: useful gain, and the ability to aim the aerial at a specific target. The LP1300, now being imported by Dick Smith Electronics, not only exhibits wide-band reception but also a respectable amount of gain. Russell Bryant gave it the once over...

Without doubt, an antenna would have to be one of the hardest pieces of equipment to review. Antennas are by their very nature inert. By themselves they are merely a collection of nuts, bolts and pieces of aluminium, arranged in a seemingly reasonable order. Connected to a radio, they are an essential element in a sometimes frustrating partnership.

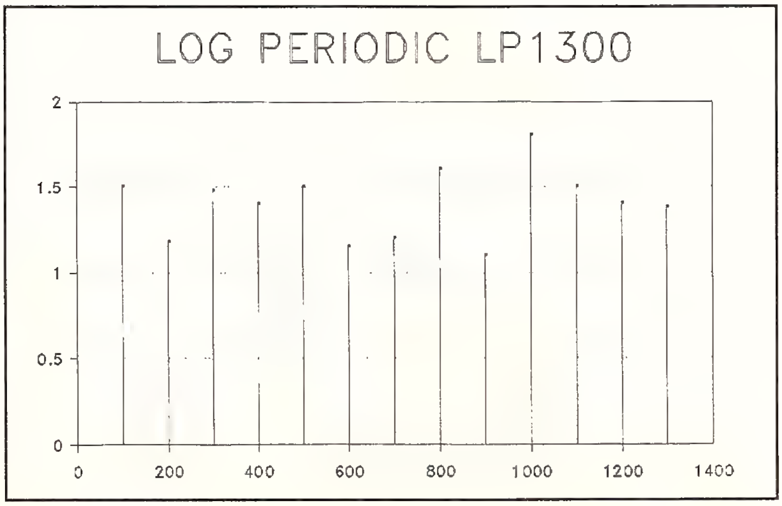
Receiver aerials come in a variety of shapes, sizes and compositions. Determining which one is best suited to your local needs is not helped by the numerous and diverse types from which to choose as well as the claims made, rightly or wrongly, as to their gain figures and frequency response. Just when you thought it safe, here is another to confuse the issue, or maybe not. Why not? Read on...

### More than coat hanger technology

Irrespective of the construction method behind it, the average receive-only aerial works as it should — it *receives*. But then again, so does a coat hanger! So why spend more than $200 for a couple of dozen bits of aluminium rod and U sections? Well, in this particular circumstance, you will be purchasing one of the better scanner aerials manufactured thus far. The log periodic is more than a coming together of metal alloy and nylon, and this Yagi-type aerial uses precise mathematical formulæ to determine the amount of gain applied at each specific frequency, which elements are to be driven and the overall electrical properties of the aerial.

Whereas the common Yagi uses a single dipole or delta-matched driven element located at the rear of the aerial, logs are generally speaking end-fed, in this case with cable termination at the front. Unlike the normal Yagi, all elements of a log periodic can be driven, however not all elements will be in use at any one time. Element usage is wholly dependant upon the frequency being received.

Log periodic aerials differ further from routine Yagis because they (logs) exhibit wide frequency coverage. Yagis normally only have a bandwidth of about 80 MHz... if you're lucky. In the case of the LP1300, you can expect to cover a bandwidth of 1200 MHz or more, especially below the 100 MHz bottom useable frequency. The bandwidth of an aerial is usually expressed as a ratio. For a discone it's 8:1, or about 100 MHz to 800 MHz. For a log periodic the ratio is 12:1 which equates to the manufacturer's claim of 100 MHz to 1200 MHz.



### The bottom line

How the log periodic works is technically described as follows: the electrical properties' mean resistance is measured against the characteristic impedance of the feed line, and where the drive point impedance varies periodically with the logarithm of the frequency being received at the time. That's somewhat a mouthful, and probably of little consequence to many, but the bottom line is *they work*!

With that background out of the way, let's get down to facts and figures of the Maldol LP1300. As previously mentioned, it covers a bandwidth of 100 to 1300 MHz, and will — by virtue of the fact that is a metal substance of appropriate length connected to a receiver by a suitable unbalanced co-axial feed line, all of which is exhibiting an impedance of about 50 ohms — go above and below the limits set by the manufacturer.

Gain, depending on the frequency being received, varies from 6dBi to about 10 dBi, which equates to an increase in signal strength by a factor of three or four. Cable termination is an M connector, which is probably better known in this country as an SO239 socket. Impedance is a nominal 50 ohms, which means that, at a pinch, both 52 ohm and 75 ohm co-axial cables can be employed without too much of an impedance mismatch.

### Low VSWR, high power

While the LP1300 is designed primarily as a receive-only antenna, it is interesting to note, especially for the amateurs and CBers amongst us, that the LP1300 can also be used as a transmit aerial on the 2m and 70 cm bands as well as the 477 MHz CB channels. Maldol, which manufactures the LP1300, claims a VSWR of less than 1.5 at 144 MHz, just over 1.4 at 430 MHz and a staggering 1.1 for 477 MHz. That's not bad considering the bandwidth of the aerial.

For further SWR readings see the accompanying diagram, not that it matters too much on receive. For those who may wish to use the LP1300 for transmitting, its maximum power input rating is 500 watts. The LP1300 has a boom length of just under 1.5 metres, with the longest element measuring 1.35 metres. It weighs nearly 2.5 kilograms and presents a wind area of 0.15 square metres for a maximum wind survival speed of 40 metres per second.

....☞

# Maldol's LP1300

## Log Periodic Yagi

### *a directional antenna for scan fans*

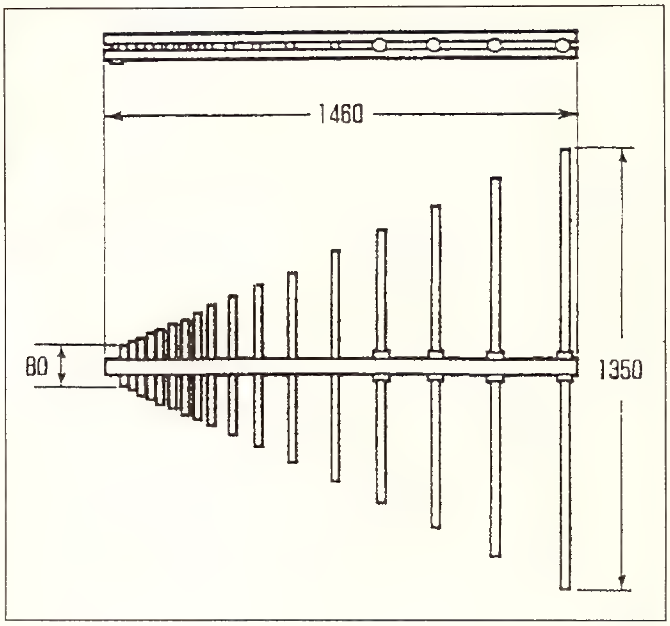
Naturally enough, the LP1300 comes in kit form, so you will need a variety of tools to put it together. A Phillips head screwdriver and a couple of spanners should be enough. All parts are supplied, with a full parts list and diagram making up the second page of the assembly instructions. The best method to determine if all parts are present is to arrange them according to the chart. That way it will be immediately obvious if anything is missing.

The actual assembly instructions comprise two pages, mainly consisting of line drawings — simply follow the sequentially numbered diagrams. It is that easy. Of the 17 elements, nine are fixed to the boom, and these solid aluminium elements are simply swung into position and secured using stainless screws. The remaining eight tubular elements are held by brackets, again fixed by stainless-type screws.

While the majority of scanner users will mount the aerial in the vertical plane, it is also possible to mount it horizontally. Deviating slightly, by mounting the LP1300 horizontally, you can generally reduce local interference somewhere between 20 and 30 dB, which is about two to three times the rating of the average scanner's built-in attenuator. Long distance vertically-polarised reception may suffer somewhat, however.

### Quality counts...

Getting back to the topic at hand, the LP1300 needs to be mounted on a mast of not less than 28mm and not greater than 60mm. Ideally the 1300 should be used in conjunction with a rotator, thereby deriving maximum benefit from this directional antenna. Simply point and listen…



When installing the LP1300 (or any aerial for that matter), try to keep it away from other metal objects, thus avoiding a distorted receive lobe, or exaggerated gain figures toward the other metal product be it a mast or another aerial. Whether you use a rotator or not, the log periodic should be interfaced to the radio with a good quality cable. It is no good spending big money on the radio, buy an up-market receive aerial such as the LP1300, then let the whole setup fall apart because low-grade RG58 connects the package together. I would suggest RG213 or RG8 as the minimum standard over more than a very few metres, particularly if you plan to tune UHF at all.

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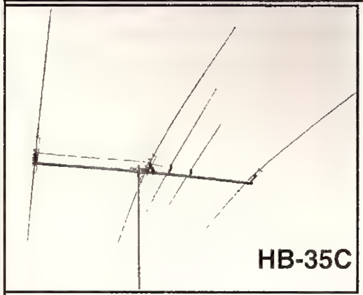

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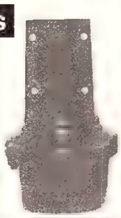

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Generally speaking, log periodics have few limitations, with only one or two springing to mind. As a rule they are normally high-impedance devices, requiring a loss-prone balun or transformer to bring the impedance down to the nominal 50 ohms, thereby permitting the use of unbalanced feed lines. Maldol has incorporated some interesting design changes into its LP1300, allowing the direct connection of coaxial cable without the need for a balun.

This eliminates losses to provide better all-round signal delivery to the radio. The classic log also electrically isolates and insulates the aerial boom from the overall function of the aerial, employing bridging straps to electrically link radiator and earth elements together. Departing from the norm, Maldol has opted to integrate the boom within the design cancelling the need for the sometimes troublesome bridging straps. This not only simplifies construction but also reduces costs.

The three general rules for coercing the most out of your aerial are height, height and, of course, *more* height. Mounting an aerial such as the LP1300 at a decently safe altitude will not only improve the reception of low-power signals within the immediate area, it will also give you the edge when chasing VHF and UHF DX signals.

Remember a couple of other rules about antennas: don't make the cable run so long that weak signals are lost within it, never to make the radio's front end and ultimately your ears. And, finally, avoid electrical cables at all cost; they are extremely hazardous to your health!

## Don't expect the world...

The true test of any aerial, especially a wide band directional one like the LP1300, is how well it grabs the signals you want. Remember that this aerial (or indeed any other) cannot produce signals from nothing. Something has to be there to begin with. Don't expect to hear services thousands of miles away, just because you have erected a directional antenna. It doesn't work that way.

Rather than treat the LP1300 gently I decided to break every rule in the book by hooking up high-loss RG58. To add to the confusion I included a join in the cable, thereby upping the potential for cable losses. Finally, as a departure from the commonsense basics of aerial mounting, I stuck the LP1300 right next to a mast and stand offs, in an attempt to distort the receive pattern.

As a test the LP1300 was mounted five metres above the ground, and its performance compared with a UHF 12dB Yagi mounted nearly 10 metres high. One thing to be aware of if that I live about 500 metres above sea level, so most services boom in anyway, but nevertheless there are few low-powered UHF repeaters around the Sydney area that have trouble making it to the scanner.

With those frequencies duly programmed into the Uniden UBC9000XLT I toggled between the two aerials. Mostly there was little difference between the two, obviously where the log held its own was on the lower bands outside the normal operating range of the UHF Yagi.

Swapping to a low-gain omnidirectional VHF high-band groundplane aerial positioned around the same height there was simply *no* competition. On the groundplane, listening to Harbour Control on 156.650 MHz I could hear the control centre and some vessels, however switching to the LP1300 I heard the controller strongly, as well as *every* ship that came and went from the harbour that day.

Again the difference was noticeable while monitoring a 5-watt hand-held being used on 156.675 MHz. While nothing was heard on the omni ground-plane, it produced a readable signal on the log. Five watts over a distance of about 60 kilometres — not bad!

## Check it out

It doesn't matter if your monitoring habits are such that you travel up and down the bands, or listen in on a dedicated frequency or on a single band, they can certainly be enhanced by the use of a directional antenna like the LP1300. A further improvement can be achieved by adding a rotator to the package along with good quality cable and connectors.

The Maldol LP1300 log periodic Yagi is available from Dick Smith Electronics stores for $249, and R&C thanks DSE for the loan of the review antenna.

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| Duoband 10-15 3ele EA | $323 |
| New 3 band verticals no traps | $195 |
| 3ele 15M | $214 |
| 6ele 15M 50mm boom S/S fix | $466 |
| NEW 10-15-20 M beam 3 el ea open sleeve feed S/S fix | $575 |
| 3ele 20M all s/steel fixings | $379 |
| Tri-band beam hy-brid 36 Coman 6ele 6M boom | $890 |
| 2M 144.100 2.2 wavelength boom | $145 |
| 12 ele 2 M | $134 |
| 80M Vert top-loaded | $265 |
| 80M Vert full size 1/4 wave 19.5M | $480 |
| M B Vert NO TRAPS 10-80 | $290 |
| 13-30 log-periodic 9 ele all stainless/stl fittings | $941 |
| Tri-band beam no traps 5 ele S/S fix | $720 |
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| 6 ele 6M N.B.S. 50mm boom | $320 |
| NEW 6M 5/8 vertical + radials | $157 |
| 2M new 5 5/8 colinear vert 9 dBd | $194 |
| 23cm 36ele BRASS-con assembled 18dBd | $175 |
| 70 cm 12ele/17ele B/feed | $102/$127 |

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*Price increase due to on-going price increases of aluminium. ie. 12 per cent in 1997 – total rise starting 1993 = 46.2%*

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# Shutdown of analogue cell network on target

By Phillip Bertolus

The first stage of the long-awaited shutdown of the analogue mobile network occurred while users were sleeping on December 31 last year. On 1 January 1997, there was 15 per cent less capacity in the big cities where the highest demand for channels exists.

The shutdown signalled the start of a new era of deregulation in the communications industry which is expected to bring a flood of new international corporations onto the domestic scene. It is almost a replay of the Pay TV debacle — huge companies struggling in an auction for operating licences.

The Australian Communications Authority's (ACA) forebear, the SMA, the government body responsible for formulating recommendations to the minister, released a discussion paper at the time which spelled out the timetable for the closure of the old AMPS network and the proposed ground rules for the re-use of the vacated channels. Essentially the paper said how many channels could be 'auctioned' off to existing mobile companies and how many would be reserved for the expected new mobile telephone companies.

At the hub of the new rules is legislation introduced into the federal parliament on 5 December 1996 which gives the government power to cancel existing licences for spectrum in the form of channels or bands of frequencies. Current users may be limited in the time they have to move operations to other bands. Vacant spectrum will then be sold off. The rules allow spectrum to be sold before it has been vacated.

One of the objectives of the new system is to make it easier for new radio-based technologies to be introduced into Australia. Fierce technological battles will be fought on Australia's air waves. A similar battle is currently under way between the Japanese, spearheaded by NEC, and the Europeans, led by Ericsson, over cordless PABX telephone handsets.

Both camps are working feverishly to produce GSM digital phones with built-in cordless units that swap over from the mobile network to the in-house telephone system as soon as they come within range, thus merging desk and mobile telephony.

The legislation also protects the market from any chance that Telstra could use its huge financial resources to buy all available spectrum and then simply sit on it to prevent competition. Closure of the AMPS network will be in five stages. The first two, the first on December 31, 1996, and the other on July 1, 1997, removed 25 per cent of channels. The remaining stages, each of 25 per cent, will be done in October 1998, April 1999 and December 1999.

A prime piece of spectrum real estate, vacated by analogue mobile users, was available for use by anybody with a sufficiently large bank balance on October 1 this year.

Anybody buying the spectrum is bound by a few rules. First, they may not re-establish an AMPS service. Second, any equipment used must not interfere with adjacent bands.

Intriguingly, this band is ideal for the fledgling American technology of CDMA (Code Division Multiple Access version IS95) digital mobile telephony and also the evolutionary but somewhat unsuccessful DAMPS (Digital AMPS version IS136).

The latter technology, DAMPS, is thought to be of most interest to Telstra. Implementing DAMPS is simply a matter of unplugging the old analogue AMPS cards and plugging in the new Digital AMPS cards, more or less like swapping a video card in a PC.

The advantages would be enormous — for example, no new towers, little software change, faster setup…

Obviously a new network based on CDMA would mean more new towers, a feature that is sure to cause considerable pain to the network's owners. It used to be that a new tower once took merely three months to put in place. These days 18 months is the more common period needed.

Under the original licence conditions offered to Vodafone in 1992 the start of closure needed to happen by 1996.

There is also something of a paradox in that we have on one hand a government policy of introducing more competition into the communications marketplace and on the other we're closing down the most popular and profitable network.

Obviously the new systems are technologically better, but do we need to force people to the new environment when the old systems are still economically competitive? The original technical arguments of higher spectral efficiency of GSM over AMPS are still being debated in technical circles.

A senior Motorola executive from the US recently said that NBAMPS (Narrow Band Advanced Mobile Phone System) was as efficient as GSM, a fact which has contributed to the US adopting digital phones more slowly than other parts of the world.

Yet GSM *has* been a global success. Essentially the product of a regulated communications environment in Europe, GSM digital's success can be contrasted with the deregulated environment of the US.

The standards war in the US has left them years behind in the deployment of digital technology.

There is no doubt that Australia will now have access to all the latest technologies, but will this simply lead to a Beta-VHS type war?

*Phillip Bertolus is the principal of* ***Program Development Systems****, a Melbourne-based software company. He can be reached by fax on (03) 9563 7855, via CompuServe 100236,2752 or via the Internet at pds@iaccess.com.au.*

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## NEW MODELS FOR '97

## TS-570S HF + 6M 100W RRP $2,669⁸⁰

Representing the new standard in performance by which all other transceivers will be judged, the TS-570S is the perfect middle-class rig for mobile or station operations. Designed to answer the call in any application, this heavy-duty HF transceiver boasts a large heatsink and improved heat dissipation characteristics for extra reliability. But most importantly, the TS-570S incorporates Kenwood's own 16-bit DSP AF signal processing that enables it to provide you with extremely effective interference reduction plus high quality TX and RX audio. Additionally, a central frequency control system offers high frequency stability while a large, positive-type LCD display ensures greater visibility for easy operation. Completely equipped with a preset auto antenna tuner and ideally sized, the TS-570S is sure to become standard equipment for operators who demand the very best.

• 16-bit DSP noise reduction • DSP filters • DSP voice equaliser/speech processor • Large LCD display • S/PWR/COMP/SWR/ALC meters • Preset auto antenna tuner • CW auto tune • Menu system • 100 memory channels • Quick memory • 10-key direct frequency entry • Operating guidance feature • Mobile/fixed station size (270 x 96mm) • Heavy-duty design • 5W QRP operation • Built-in electronic keyer • CW message memory • CW reverse mode • Full break-in and semi break-in • High-speed 57600 bps PC control • Dedicated packet port

## TM-V7A DUAL BANDER RRP $1,005⁷⁰

Night and day. Kenwood's new TM-V7A FM dual-band (144MHz/430MHz) transceiver is like no other. Featuring a tall, detachable control panel with four multi-function keys and a cool-blue reversible LCD, the TM-V7A represents a bold departure in ergonomic design. Visibility and operability are both exceptional and thanks to the on-board Guide you never have to look at the manual. Full marks for convenience too: the unique programmable memory can store five distinct operating profiles ready for instant recall at the push of a button. With up to 280 memory channels, built-in CTCSS, DTSS and pager functions, plus the ability to receive two frequencies on the same band, the TM-V7A is fully equipped for high-performance mobile communications.

• Data connector for 1200/9600 baud packet • Automatic band change • Auto simplex checker • AIP (Advanced Intercept Point) • 147 channel visual scan (spectrum display) • TO & CO scan stop modes • Key function display • Selectable frequency step • Auto repeater offset • Power-on message • Auto power-off • Time-out timer • Optional multi-function DTMF microphone with backlit keys (supplied with M3 type)

KW0697GC/ce

## TS-870S DIGITAL HF RRP $3,983⁸⁰

Kenwood's new TS-870S is a superb example of how far digital technology can transform the world of communications. The first of a new breed, this HF all-mode transceiver is equipped with powerful twin 24-bit DSP (digital signal processors) at the IF stage – an innovation that leads to such benefits as high-efficiency digital filtering, powerful noise/interference reduction, equalisers and DSP detection. The TS-870S is digital in other ways: it can be fully computer-controlled using a high-speed link. There's an antenna splitter, dual antenna connectors and an automatic antenna tuner that works on transmit and receive. All of this, plus the range of high-performance features for which Kenwood rigs are renowned. By any measure, Kenwood's TS-870S merits true distinction.

• IF-stage Digital Signal Processing & Digital Filtering • menu system • 100 memory channels • Full band scan, group scan, programmable band scan, memory scan with memory channel lock-out • TO & CO scan stop modes • SPAC noise reduction (CW/SSB) • High-speed (57,600 bps) computer control • AIP • IF auto notch • Full-featured programmable electronic keyer • Full break-in & semi-break-in • CW reverse mode • All-mode squelch • Operational digital recording (DRS) unit

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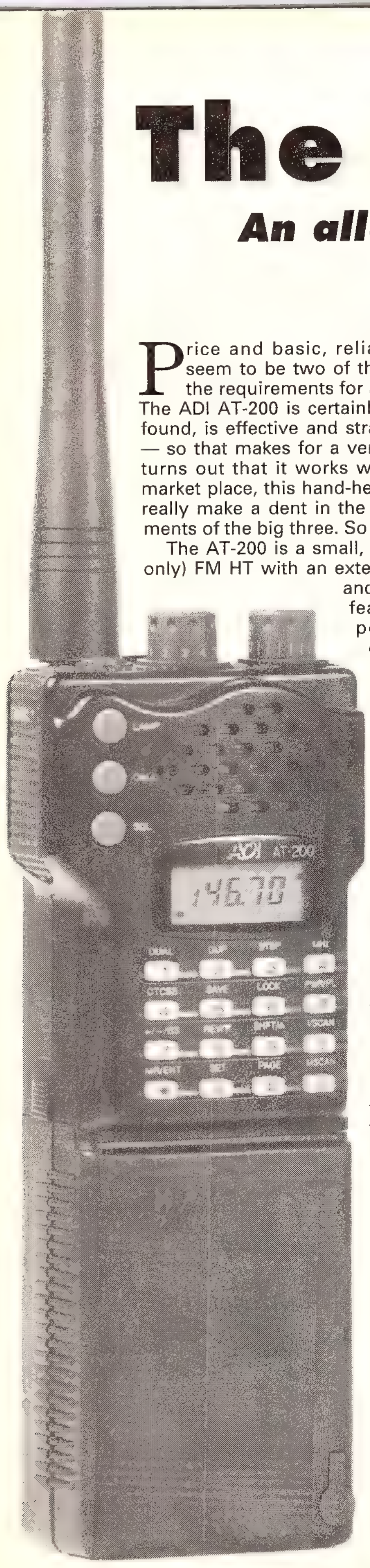
# The ADI AT-200

## *An all-new two metre FM hand-held*

By Neil Duncan, VK3ND



Price and basic, reliable operation. These seem to be two of the criteria often cited in the requirements for a hand-held transceiver. The ADI AT-200 is certainly inexpensive and, as I found, is effective and straightforward to operate — so that makes for a very good start. Now, if it turns out that it works well too, then in a wide market place, this hand-held FM transceiver could really make a dent in the sales of the HT departments of the big three. So let's take a peek.

The AT-200 is a small, monoband (two metres only) FM HT with an extended coverage receiver and a number of additional features. The transmitter power level you get depends on the battery in use as well as which of the three power settings you choose. With the arrangement that arrived in the compact cardboard box, a choice of five or 2.5 watts or just 350mW of transmit power was made possible — and that seems plenty to me. In fact, the RP-120 battery pack is almost exactly the same size as the transceiver itself so I guess you'd just about expect it to run the full five watts!

On receive, the unit (as supplied) covered the same domain as the transmitter, namely 144 to 147.995 MHz with nary a spot outside of that being available. Now, while the specifications talk of an extended coverage receiver (with the usual "...performance outside the amateur bands cannot be guaranteed..." statement) it doesn't seem to give an ounce away about how you actually go about achieving that extra coverage. But no fear — the accompanying sheet details just how to fix that. You hold down '3' and turn the power on and bingo, extra receive coverage appears. Do that again and you gain *extra* extra coverage!

Wow, that all worked — once I'd done that I could then dial up anywhere from 100 to 179.995 MHz on the receiver. The problem is though, that if you go below 126 MHz, the PLL has trouble locking up, and there goes the receiver capability. The LCD numbers just flash on and off, so you're left in no doubt as to whether it's actually a goer or not. I verified that above that frequency but below the two metre band, it received AM transmissions just fine, but go under 126 MHz and it is deaf.

On 135.7 MHz in Melbourne, there is an AM station servicing the aircraft industry. This set matched my reference hand-held for AM reception there. On two metres, it also matched my own HT for sensitivity, cross modulation immunity (it forgives some pagers but lets some others through) but not for audio quality or audio output. Still, it is perfectly acceptable even in that respect. I have one confession to make though. I couldn't find how to set the receiver back to 'amateur bands only' mode. I found how to reset the whole thing, but even after doing that, the receiver stubbornly stayed 'wide band'.

On transmit, the signal is clean with respect to spectral purity and audio quality. I didn't receive any complaints (nor glowing comments) but was repeatedly told my audio was natural and quite satisfactory.

The AT-200 has a 12 key keypad and via that you can select any of 20 memories, various and comprehensive repeater modes and even a 'priority watch' system (ADI calls it 'dual watch'; it switches over to another channel once every three seconds to have a quick listen).

The scanning facilities provided scan at a moderate speed, and allow you scan over the memories or over the entire VFO range. Now, you remember the wide band receiver modification I did? Yeah, the scanning system now covers the whole, wide range. Ah well, so much for speedy scanning. I guess it will be memory scan for me from now on...

The keypad also allows you to enter a frequency by pushing buttons, enables different dial tuning speeds, and a MHz jump system. It works in conjunction with a function key on the left side.

The DTMF facilities come as standard in the AT-200 and will be useful in some scenarios I guess. Likewise, a full and comprehensive selective calling system is built in, and when used in conjunction with a another, similarly-equipped, unit should prove effective.

You can purchase, as optional extras, a CTCSS decode module, a variety of different battery packs and chargers and items for using the device in the car. The call channel system is well implemented and a set-and forget squelch system with a cunningly 'difficult to get at' rotary knob being mounted on the top of the set.

The ergonomics of the set are excellent — even outstanding for so small a radio — but it comes with one glaring fault. So long as you don't talk, everything is fine. The buttons, while small are perfectly accessible, so it is not that. The top-mounted antenna is easily removed and is waterresistant, so again, no problem. The knobs and buttons are sensibly located and there is an extremely intuitive feel about the set. So what is wrong with the set when speaking? Simple: the microphone is just above the LCD display. One word and the whole thing steams up. I guess it depends who you are talking to a bit but that little matter is sure annoying. You end up wiping the AT-200 on your jumper at the end of each over!

### Summary

The AT-200 is a fine little HT and is a credit to the ADI Corporation. It is a sensitive and fully-powered HT with two small annoyances, namely the weaker than normal receive audio and the LCD's proximity to the microphone. Apart from that, it presents itself as great value for money — an inexpensive but thoroughly versatile unit which should bring a great deal of utility and pleasure to a large number of people. To be recommended!

**Radio and Comms** thanks Kevin Cavanagh's **Ham Radio World** for the loan of the review transceiver.

### Specifications

**General**

Mode: FM only.

Antenna impedance: 50 ohms.

Supply voltage: 13.8 VDC

Current consumption (typical): RX 0.35A, TX up to 0.9A depending on power level settings. A power-save receive mode is available (13mA).

Size: 55 x 83.5 x 31 (mm, WHD, excluding battery and case).

Weight: 0.185 kg (excluding battery and case).

Memories: two banks of 10 with one call channel.

**Transmitter**

Frequency coverage: 144 to 147.995 MHz.

Output power levels: From 1 to 5 watts depending on power setting and battery.

Maximum deviation: ±5kHz

Spurious radiation: <-60dB

**Receiver**

Frequency coverage: 100 to 179.995 MHz. Note the comments in the text.

Circuit type: Double conversion with IF frequencies of 455 kHz and 21.8 MHz.

Sensitivity: better than 0.1µV in the amateur band.

AF output: 0.25W into 8 ohms @ 10% THD.

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## FT-50R 2m/70cm Handheld

Grab a great bargain on the FT-50R with standard version keypad.The Yaesu FT-50R is an amazingly compact 2m/70cm amateur band handheld transceiver which provides MIL-STD-810 shock and vibration resistance plus super wideband receiver coverage, simple menu settings for most functions and compatibility with the optional Yaesu ADMS software/interface package for PC programming. Supplied with FNB-40 slimline 6V 650mA/H NiCad battery pack, flexible 2m/70cm antenna and modified M-9626 AC plug pack adaptor for NiCad charging.

D 3655

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## 2m 80W RF Power Amplifier

Designed for use with 2m FM handhelds, this solid 80W RF power amplifier really boosts your handheld signal at home or in the car. It works with RF levels of 0.5 to 5W, provides 80W typical output with just 2.5W input, and just 1W input will still provide over 40W output. A 12dB gain GaAs FET receiver pre-amp can also be selected for improved performance in quiet RF areas.
Frequency range 144-148MHz only.
Requires 13.8V DC at 20A max. Size: 124x44x208mm (WHD) inc protrusions. D 2520

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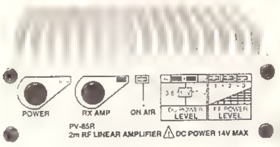
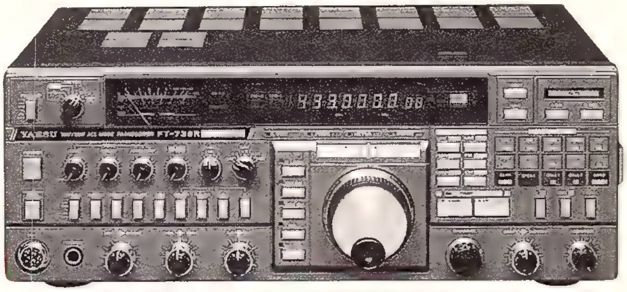


## FT-736R VHF/UHF Base Station Transceiver

Whether your interest is in talking through your local repeater, operating SSB DX, or talking to the world via satellite, this high-performance multimode base station transceiver can do it all! In its standard form, the FT-736R provides 25W output on the 2m (144-148MHz) & 70cm (430-450MHz) bands in SSB, CW, and FM modes. Can be expanded to cover the 6m (50-54MHz) & 23cm (1240-1300MHz) bands by installing optional modules.

**Features:**

- Keypad frequency entry, 100 memories, selectable FM channel steps
- 2 full-duplex VFOs - transmit & receive frequencies (and modes) can be tuned independently or synchronously for satellite operation.
- Adjustable IF Notch and IF Shift filters, Noise blanker, 3-speed selectable AGC.
- Speech processor and VOX for SSB, Digital input connection for packet TNCs.
- Efficient switch-mode AC power supply. D 2920



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D 4808 MOBILE ONE **$34.95**

## Revex W560N HF/VHF/UHF SWR/PWR Meter

Quality Japanese wide-band SWR meter, offering 2 sensors for 1.8MHz to 525MHz coverage! Provides metering of 3 power levels (3W, 20W, 200W) and SWR. Uses an N-type socket for the VHF/UHF sensor for minimal loss. Measures 120 x 80 x 85mm.

D 1375

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## 2m/70cm Dualband Handheld Antenna

This flexible antenna covers the 2m and 70cm amateur bands, providing better performance than the standard ones supplied with latest version dualband transceivers such as the Yaesu FT-50R. The antenna consists of a thin, flexible metal whip section which is joined to an SMA-type male connector, providing 1/4 wave performance on the 2m (144 to 148MHz) band and 5/8 wave performance on the 70cm (430 to 450MHz) band. Made in Japan.

D 4338 **$39.95**

## 6m 1/2 Wave Base Antenna

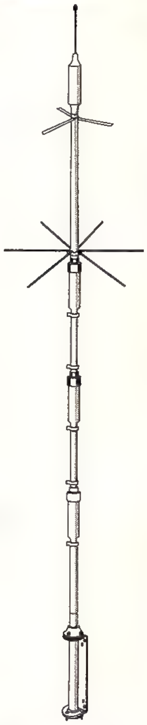
A rugged, Australian-made vertical antenna designed to cover the 51 to 54MHz range, with minimum SWR around 53MHz. Built using high tensile T81 grade aluminium, it's just 2.9m long with a sealed base section and 100W minimum power rating. Complete with mounting hardware.

D 4825 D & G Antennas **$69.95**

## Rugged HF 5-Band Trap Vertical Antenna

The rugged 5BTV incorporates Hustler's exclusive trap design (25mm solid fibreglass formers, high tolerance trap covers and low loss windings) for accurate trap resonance with 1kW (PEP) power handling. Wide-band coverage is provided on the 10, 15, 20, and 40m bands (SWR typically 1.15:1 at resonance, <2:1 SWR at band edges) with 80kHz bandwidth typical on 80m at less than 2:1 SWR. An optional 30m resonator kit can be installed without affecting operation of other bands. High strength aluminium and a 4mm (wall thickness) extra heavy-duty base section guarantee optimum mechanical stability. At just 7.65m, the 5BTV can be ground mounted (with or without radials, although radials are recommended), or it can be mounted in an elevated position with a radial system. Unlike other antenna designs, the 5BTV can be fed with any length of 50 ohm coax cable.

D 4920 HUSTLER **$349**



### 30m Resonator Kit

Adds 30m coverage to the 5BTV and includes all hardware.

D 4921 **$89.95**

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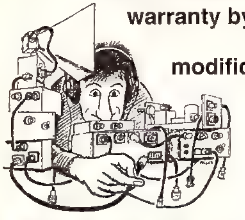

Be aware that you may void a warranty by performing any of the following modifications. R&C has not tested them and makes no warranty as to their serviceability.

## Mods, Fixes and Updates

*By Greg Towells, VK2GJT*

If you own a **Realistic PRO-43** and are interested in extending your receive horizons, literally, have a look at this mod. The aim of this procedure is to allow the PRO-43 to receive frequencies from 6 MHz to 1000 MHz.

This is accomplished by setting the PRO-43 to non-standard splinter frequencies, and tricking the CPU to step the radio beyond the normal band edges. To derive the non-standard splinter frequencies it is necessary to change the diode configuration matrix, and to use the monitor-search function.

The hardware modification should take about 30 minutes. The remaining programming / search will take as little as 45 minutes (depending on how interested you are in the signals you encounter during the 806 MHz to 30 MHz search to be run).

I claim no responsibility for any damage done to your radio by attempting this modification. I will also not be responsible if you use this radio to break the law by monitoring cellular mobile telephone transmissions. Anyone attempting this modification should be comfortable working with surface mounted components and have a reasonable familiarity to the key pad functions of the radio.

Okay, with the usual caveats out of the way, let's go. As usual, I recommend you read the whole lot before starting a thing.

### Hardware modifications

Remove the antenna and the battery pack. Remove the four screws and then the rear cover. Remove the six screws.

Using a knife blade, pry the connector at the bottom of the circuit board apart. With the connector apart, the top circuit board can be pressed side to side to allow removal of the two hidden screws.

Lift the two stacked circuit boards (watch the connectors on the right edge of the main board). Swing the two stacked boards to the left.

Remove the RF shield by heating the four solder pads and *gently* prying the shield up at the corners. Watch for any surface mount components!

Note the location of diodes D1 - D5 (factory US configuration has diodes D1, D2, D4 in place). See **Figure 2**. Diodes D1 - D5 enable the following functions:

**D1** - KEY LOCK switch enable
**D2** - 30 to 54 MHz enable
**D3** - 54 to 88 MHz enable
**D4** - Cellular lockout enable
**D5** - Cellular 12.5 kHz step enable

The normal broadband coverage modification (**Figure 2A**) with D1, D2, D3 in place providing the following coverage: 30 to 88, 118 to 174, 220 to 512 and 806 to 999.9875 MHz (with 30 kHz channel spacing in the highest band).

If your radio does not have D3 then move D4 to position D3, and note that D5 should not be in place.

Refer to **Figure 2B**. Solder a diode, cathode side (which has the line), to the upper side of the D5 position. Make sure that the leads are the proper length to allow this new diode to sit on top of D2 and D3, and that none of the legs touch. Solder the anode side to the lower side of the D1 position.

Installation of this diode allows the user to select the channel spacing in the cellular bands. KEY LOCK *off* at time of power on yields 30 kHz spacing. KEY LOCK *on* at the time of power on yields 12.5 kHz spacing. By using the monitor memory and changing this configuration in the middle of a search in the cellular band we are able to derive non-standard splinter frequencies.

This seems to evade the CPU programming of the allowable band edges, allowing the radio to search beyond normal frequency coverage. At 30.005 MHz, the next downward frequency (at 5 kHz steps) is 30.000 MHz. The CPU then realises it has reached the lowest valid frequency, so that the next step down the operating frequency is set to 999.9875 MHz. We will store a frequency of 30.0025 MHz in channel 200.

Using the DIRECT feature of the radio we are able to tune to a frequency above or below any stored frequency. The CPU reads 30.0025, steps down by 5 kHz and is now at 29.9975. Since the frequency still does not equal 30.000 MHz it is able to step down again. 29.9925 MHz... you probably get the idea. At 2.5 kHz it does

FIG 2: PRO-43 DIODE CONFIGURATION

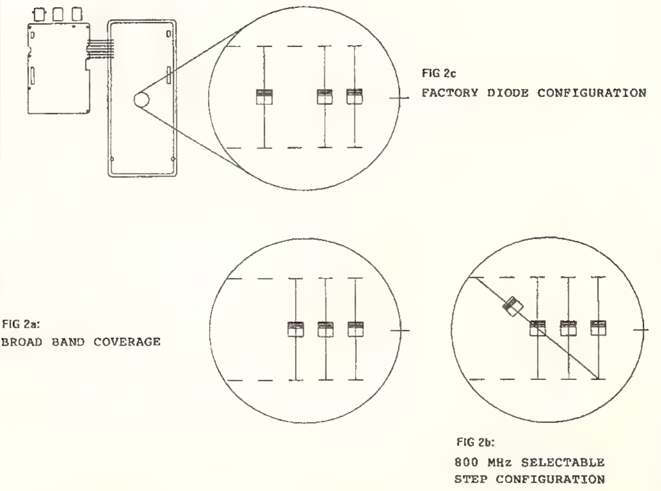

FIG 2c
FACTORY DIODE CONFIGURATION

FIG 2a:
BROAD BAND COVERAGE

FIG 2b:
800 MHz SELECTABLE STEP CONFIGURATION

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jump up to 999.9975 MHz and then to 895.9875 MHz. (The sensitivity drops below 15 MHz, but remains useable to about 6 MHz.)

In the procedure below, you will store band edge frequencies that can be stepped above or below to grant the added coverage.

The CPU will not store in memory any frequency outside of the permitted coverage. This necessitates the use of the direct mode.

Reassemble the radio. That is the end of the hardware modifications. The next procedure is the keyboard entries.

### Using the keyboard...

With the KEY LOCK switch OFF turn the radio on. The unit will now step by 30 kHz steps from 825 MHz to 845. Set the squelch to open (MIN) and volume to low.

Input the following keystrokes:

PGM LIMIT 30 ENTER LIMIT 825.120 ENTER DOWN LIMIT DOWN MON

(The display should read 825.120 down search)

Turn the KEY LOCK switch ON and turn the radio off. Turn the radio on and set the KEY LOCK switch to OFF.

Input the following: (Squelch should still be open, so keep the volume at minimum to save your sanity.)

MANUAL MON DIRECT DOWN

(The display should read 825.1075 down search)

Close the squelch to allow the radio to search down. Use the UP DOWN and the squelch control to stop the radio at 806.0075 MHz

Input the following:

MON PGM 194 PGM MON ENTER

(Channel 194 has now been programmed with 806.0075 MHz)

DIRECT DOWN

(The display should read 805.9950 down search)

Close the squelch to allow the radio to search down. You will probably find birdies in the 560 to 700 MHz range. Use the UP DOWN and the squelch control to stop the radio at 511.995 MHz.

Input the following:

MON PGM 195 PGM MON ENTER

(Channel 195 has now been programmed with 511.995 MHz)

DIRECT DOWN

(The display should read 511.9825 down search)

Close the squelch to allow the radio to search down. NOTE: From this point on, I have listed frequencies that you most likely will program to your radio.

If your frequencies are not exactly the same, they will work as long as the last small digit is a 5 (0.5 kHz), and the frequency is within the normal allowable frequency band limits. By this time you have probably noticed that the search step is per the next valid band the radio will encounter in the direction being searched.

Use the UP DOWN and the squelch control to stop the radio at 220.0025 MHz. Input the following:

MON PGM 196 PGM MON ENTER (Channel 196 has now been programmed with 220.0025 MHz)

DIRECT DOWN (The display should read 219.9975 down search)

Close the squelch to allow the radio to search down. Use the UP DOWN and the squelch control to stop the radio at 173.9975 MHz. Input the following:

MON PGM 197 PGM MON ENTER (Channel 197 has now been programmed with 173.9975 MHz)

DIRECT DOWN (The display should read 173.9925 down search)

Close the squelch to allow the radio to search down. Use the UP DOWN and the squelch control to stop the radio at 118.0225 MHz. Input the following:

MON PGM 198 PGM MON ENTER (Channel 198 has now been programmed with 118.0225 MHz)

DIRECT DOWN (The display should read 117.9975 down search)

Close the squelch to allow the radio to search down. Use the UP DOWN and the squelch control to stop the radio at 87.9975 MHz. Input the following:

MON PGM 199 PGM MON ENTER (Channel 199 has now been programmed with 87.9975 MHz)

DIRECT DOWN (The display should read 87.9925 down search)

Close the squelch to allow the radio to search down. Use the UP DOWN and the squelch control to stop the radio at 30.0025 MHz. Input the following:

MON PGM 200 PGM MON ENTER AM/FM (Channel 200 has now been programmed with 30.0025 MHz AM)

To listen to your favourite station on 15.420 MHz (for example), input the following:

MANUAL 200 MANUAL DIRECT DOWN Use the UP DOWN and the squelch control to stop the radio at 15.4155 MHz

Input the following:

UP (The display will now read 15.4175) MON The radio is now locked to the correct frequency (the AFC will lock the radio to 15.420 MHz)

To listen to HF CB, channel 19, 27.185 MHz (yes, I know, but it is simply as an example). Enter to the key pad:

MANUAL 200 MANUAL DIRECT DOWN

Use the UP DOWN and the squelch control to stop the radio at 27.1775 MHz

Enter the following:

UP (The display will now read 27.1825) MON The radio is now locked to the correct frequency (again, the AFC will lock the radio to 27.185 MHz)

To listen to TV channel audio on 185.760 MHz. Enter the following:

MANUAL 197 MANUAL DIRECT UP

Use the UP DOWN and the squelch control to stop the radio at 185.7575 MHz.

Enter the following:

MON The radio is now locked to the correct frequency (the AFC will lock the radio to 185.760 MHz)

### Notes

It is necessary to drop below the desired HF band frequency and then search up to re-enable the VHF-LO band circuitry. None of the other bands require this.

The lowest frequency I've been able to copy without modification to the RF circuitry is 5.8 MHz.

The best SWL sensitivity is from 15 MHz and up. Use a decent size antenna for 30 MHz frequencies, rather than the supplied one. An outdoor antenna would be an even greater improvement. When listening to 10 metre FM check your mode.

If the keypad operations must be interrupted, it is not necessary to restart the programming from 825.120 MHz. Simply go to the last memory channel programmed with a non-standard splinter channel in the manual channel mode. Then enter to the key pad DIRECT DOWN

This will restart the search from the last possible frequency.

### Steps to enhance HF receive sensitivity

Once you have carried out the above modification, you might like to incorporate the following addition to improve the HF sensitivity. It is a fairly simple procedure. Remove L101, and add the circuit shown in **Figure 1**.

Parts required are:

C1 = .01μF Cap

C2 = .01μF Cap

L1 = inductor (use L101 if not broken). Suggest using an inductor from a Radio Shack Bulk part assortment 273-1601

C3 = .047 pF Cap (Approximately)

Point 1 in Figure 1 is the junction of L101, C101 and the antenna connection. Point 2 is the junction of L117, C205, and R135.

Have fun.

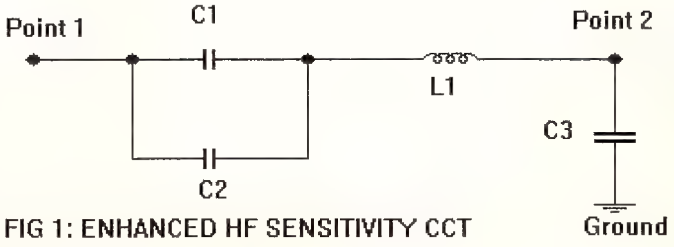

FIG 1: ENHANCED HF SENSITIVITY CCT

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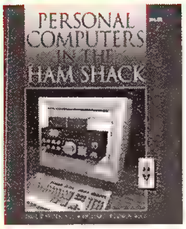

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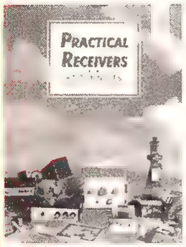

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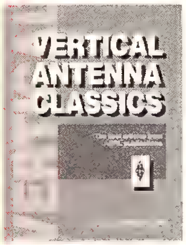

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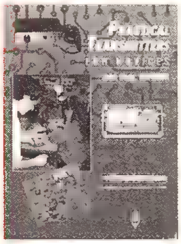

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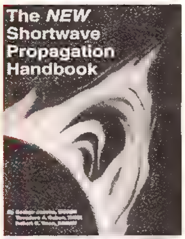

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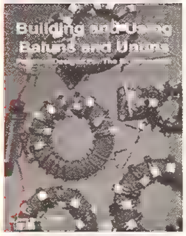

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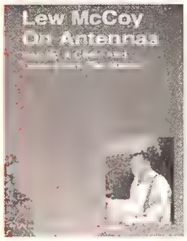

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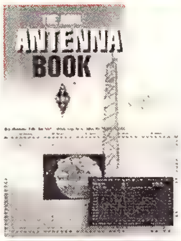

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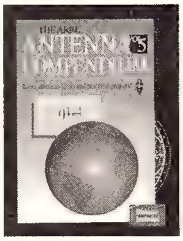

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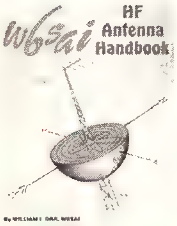

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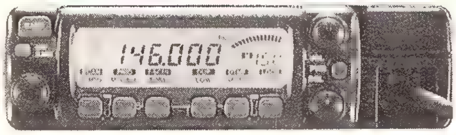

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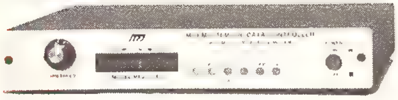

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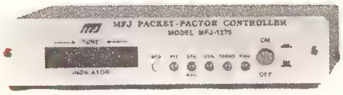

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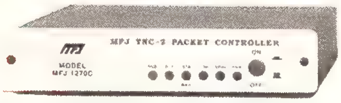

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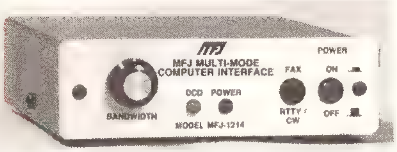

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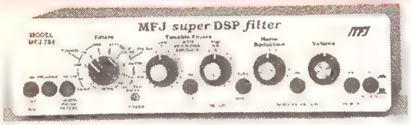

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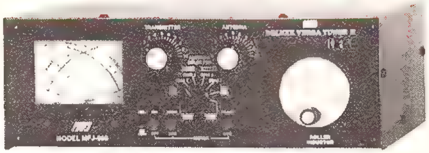

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- Height: 29 feet
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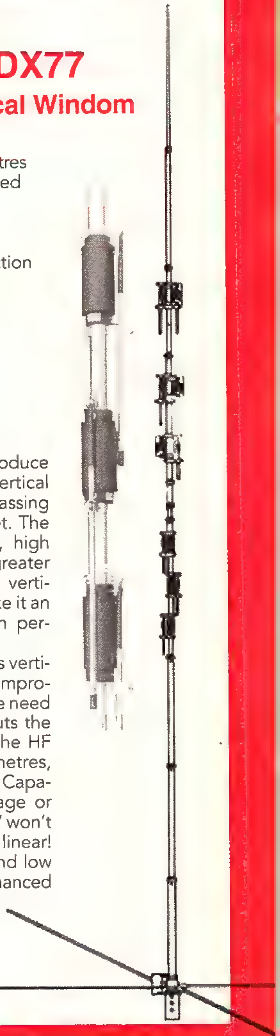
| | |
|---|---|
| 10 metres | 1.7MHz |
| 12 metres | 100kHz |
| 15 metres | 500kHz |
| 17 metres | 100kHz |
| 20 metres | 250kHz |
| 30 metres | 100kHz |
| 40 metres | 150kHz |



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# 11m DX International

By Jack Haden, VK2GJH...
PO Box 299, Ryde, NSW 2112

Welcome to the first DXI column for 1998 and I wish all DXers the very best for the New Year and hope it bears us all better DX fruits than the past two or so years. The experts keep saying we passed the bottom of the cycle some months back and things are on the way up.

The band is gradually opening to countries further afield of the Asia/Pacific rim, albeit at a snail's pace! The long-awaited European openings are now back with us although, at times, signals are not huge, some European DX is better than no European DX!

A huge solar flare in early November knocked the backside out of the HF bands and thus propagation either totally disappeared or was reduced considerably on the majority of bands. The usual shortwave fade out that follows a big solar flare knocked the proverbial guts out the 11, 15, 17 and 21MHz bands for a short time with 27MHz collapsing as the domino effect took hold. Amazing what Mother Nature can do! Scientists report more big solar flares are expected further down the track...

There's plenty of good DX information to keep you surfing the channels during the festive season holiday period and well into the New Year. News has been flooding in as propagation slowly improves, so best of luck and enjoy the read...

### European DX report...

*It's been quite a while since we've seen a European DX report in this column due to the absence of any good long-haul DX on the band. During November we were treated to a number of good propagation paths to the continent with the band generally opening around the 0700z mark and lasting through to 1000z or thereabouts. France, Italy, Belgium, Denmark, Balearic Islands, Malta, Lithuania, Armenia, Latvia, Portugal, Greece, Germany, Northern Ireland, Scotland, Wales and Spain amongst others have been quite regular during these openings.*

***Poland** has been coming through on and off since early October signalling better things to come. The most active station noted was the 161-AT-230 followed by the 161-GR-108, 161-ST-116 and the 161-PRS-07 with varying signal reports.*

***Sardinia Island** came through quite well at 0812z by way of 165-IS-101 operated by Paulo, and at the time he was a good five by three report but subject to noise and fade.*

***Luxembourg** struggled to make it through the noise at 0845z with 54-AT or AC-013 coming through at a poor three by one signal report. Some minutes later 54-PR-113 was heard marginally better at a four by one report.*

***Monaco** was heard with a very weak four by zero report at 0904z with 107-AT-?? leading the way, but noise from an electrical storm made the going tough for Sydney DXers.*

***Gibraltar** came up against strong competition from Italian and French stations at 0845z with a 55-AT station struggling against QRM and poor conditions, when the station only managed a three by two report at the very best.*

### Tweed Radio Field Day...

Despite declining interest in the radio hobby — mainly due to poor propagation over the past couple of years — attendance was about the same as last year at the **1997 Tweed Radio DX Group Field Day**. Held over the weekend of October 25 and 26, there was fun to be had by all, and the official opening was performed by the very popular Queensland politician **Pauline Hanson**...

The *Laurie Memorial Trophy* was won by Steve 43-TR-07 but, since the contest, people were sad to learn that long-time member Chris had become a 'silent key', and the prize was later accepted by his widow. Chris was 43-TR-08. *Bucket Mouth of the Year* was awarded jointly to Marty 43-TR-199 and Tanya 43-TR-424, both from Queensland. Once again, special thanks go out to **Kyle Communications** for its enthusiastic support by donating prizes for the event.

Joe 2-TR-207 from Washington State rubbed shoulders with the locals. It was a pity that two members from Germany failed to make the shindig; last heard they were still enjoying themselves in far north Queensland working some exotic Asian DX on the radio!

Bryan 43-TR-01 reports that, although Australian membership figures have declined a little (approx 390 total), overseas membership has in fact increased and is around the 3,800 mark, and with the DX now picking up it's anticipated that overall figures will improve. It was also announced the 1998 Field Day would be held over the weekend October 17 and 18.

Tweed Radio is an all-Australian club founded and run by Australians for Australians, and thus the all important dollar stops here, unlike some other groups around. Interested? Drop them a line with a stamped, self-addressed envelope via PO Box 977, Ipswich QLD 4305.

### Mail problems in Eastern Europe

News to hand from Europe reports mail problems in the former USSR along with Romania, Bulgaria, Estonia and Albania currently exist. It appears that corrupt postal staff have been detected going through foreign mail looking for currency and anything else of value that can be sold on the black market.

A radio amateur in Russia (50 prefix) recently reported that a rort is operating in the main Moscow mail centre, with some former KGB members working in the foreign mail section who openly loot foreign mail. DXers are advised not to send any currency with QSLs; just IRCs, which appear to be getting through.

### Slims exposed...

The callsign of Michele the 77-AT-103 in Ghana is being pirated with the end result being that many cards received by the QSL manager Mario 1-AT-157 do not tally with the log entries supplied by Michele.

The Svalbard controversy surrounding the recent operation of 171-CS/DX has proved to be a slim after weeks of debate and comparing of notes. Alfio the 1-CS-005 has now confirmed what everyone more or less expected, that 171-CS/DX was a slim.

Recently a station was heard calling out as 241-PI/DX Spratly Islands in mid-November but it was later learned that the station was located in Indonesia and not the Spratly Islands as first thought. Beam headings collaborated by Asian DXers confirmed the location as Indonesia.

### Help required...

A note from Europe informs me that British DXer Ian the 26-AT-225 will be coming to Australia in April 1998, and will visit Queensland, the Northern Territory and South Australia. Needless to say, he hopes to be active on the radio. Ian needs information on the possibility of activating some Australian islands for IOTA purposes from experienced Australian IOTA DXers. His address can be found in the AT callbook and any help would be gratefully received.

### American DX

Although conditions are still in fits of leaps and bounds, there's been some good DX from good old Uncle Sam to keep the fires burning. The following have been logged in recent weeks; 2-AT-101, 2-AT-

**Jack Haden checks out the DX on 27MHz...**

105 2-AT-178, 2-AT-231, 2-AT-241, 2-AT-301, 2-AT-416, 2-AT-419, 2-AT-536, 2-RJ-173, 2-AC-2697, 2-OSB-123, 2-WI-319, 2-KLC-477, 2-RA-103, 2-RA-105, 2-KR-111, 2-KK-04, 2-PP-002, 2-PP-008 and 2-CC-032 amongst others using 'novelty' callsigns. All were logged from around 1800z onwards from a variety of states ranging from New York on the east coast through to Alaska in the west, and special thanks go to 43-N-983 and 43-AZ-101 for submitting their log extracts.

### Asia/Pacific DX report...

**Taiwan** has been quite active with 155-AT-144 logged at 0620z with a steady five by five report. Also heard was 155-OC-102 and 155-TW-102 with good five by seven peaking nine reports.

**Wallis & Futuna** using the simple callsign of 'Gulf-Whiskey' was heard at 0145z calling in French to French Polynesia with a good five by six peaking eight report. By 0155z he had faded to a three by one showing how unpredictable the band can be.

**Guam Island** has a number of active stations on CB with 62-AT-01 at 0623z, 62-SD-01, 62-SD/0, 62-RA-101, CB-147 and 62-GU-103 all with good workable signals from late morning onwards.

**Western Kiribati** boasts one of the largest CB radio populations in Micronesia with most stations being based on the capital, Tarawa Atoll. The following have been noted recently; 224-International-08, 224-CB-1103, 224-CB-1007, 224-KR-01, 224-MI-108, Tarawa Radio-012, Kiribati CB-002, Atoll Radio-103 and many T3-CB prefixes (legal CB callsigns) right across the 40-channel block, all from Tarawa and Abemama, Abaiang and Maiana Atolls.

**West Malaysia** made the log at 0737z by way of 113-AT-671 and the signal was a fairly good consistent five by five peaking seven. Also logged from Western Malaysia was 'Radio-102' at 0818z with a five by three report.

**Hong Kong** has been heard by 43-N-983 Derrick in country NSW at 0840z so there are still some stations about on 11 metres not frightened or put off by mainland China rule. Noel the 43-DD-018 reports that he heard ASIAN RADIO-102 operated by Cheung signing from Hong Kong also at 0736z.

**Asiatic Russia** came through quite well at 0710z with Vlad signing as 302-AR-109, who was five by six at the time. Also heard around this time was 302-OS-1877 (Oleg) along with another regular Anatoly the 302-RA-230 somewhat earlier at 2342z with a fair five by four report.

The **Ukraine** made it through at 0739z by way of 315-RH/DX who worked a few in Australia. Not long after, 315-UR-012, operated by Mikhail was heard working a couple of Sydney stations and further south to Wollongong.

**China** has been reported as activate with Bryan the 43-TR-01 reporting that 203-AT/DX was heard in Queensland during November with a number of locals making a good contact. The majority still need this one for a new DXCC credit. QSL route not supplied.

### Central / South America and the Caribbean Sea...

Sporadic openings have occurred to this part of the world, but they have been few and far between. Just the other weekend I heard a number of Australian stations practically falling over each other to work a Mexican station. DX hungry?

**Mexico** appeared by way of 10-AT-156 at 2204z with a five by three report; also logged was 10-AT-263 slightly better at five by five around the 0100z mark along with 10-SE-103 down a channel or two.

**Cuba** made the log around 2228z calling 'CQ Pacific' with a poor four by one report with the simple callsign of '88 Division' by 2240z the station had disappeared.

**Puerto Rico** came through the noise at 2302z with 11-RC-103 operated by Raoul leading the way. He worked a couple of Queensland and New Caledonian stations giving them quite good reports; Raoul was a five by five here at the time.

So there we are. It's indeed fulfilling to see the column nearly back to normal with plenty of DX to report. With propagation on the up let's hope that 1998 will be indeed a bountiful year for DXers with more stable propagation paths and stronger signals to come! 73 de Jack.

## DXpedition news, views and gossip...

The **South Shetland Islands** is now active as 200-IR/0 and will conclude on July 25, 1998. The station is operated by Pat on King George Island and cards go via PO Box 1307, Southold, New York 11971, USA. You may also like to look out for 200-IR/DX operated by Dany from the Bulgarian base Kliment Ohridsky on Livingston Island, active from November through to January 31, 1998. The QSL route is not yet established.

**Galindez Island** will be around the traps until March 31, 1998, operated by Day signing as 140-IR/DX with cards going to the New York address given for the 200-IR/0 operation. An attractive colour picture QSL card is on offer for those making a sound QSO.

The **South Orkney Islands** was reported as active during November, signing as 221-IR/0 from Coronation Island using a simple ground-plane antenna and basic transceiver, with no extra grunt. The station may be still about as you read this. QSL to the New York address for the 200-IR/0 mentioned earlier.

The **Canary Islands** should be on air as you read this by way of 34-MU/DX with the station closing down around December 31. Cards go via PO Box 14, San Juan de la Rambla, Tenerife, 28420, Canary Islands, via Spain.

**Northern Ireland** is scheduled for a brief two-day operation commencing December 27 signing as 68-MU/DX. Cards go direct with the usual trimmings to PO Box 77, Lisbourn, Antrim BT28-2RD, Northern Ireland, UK.

**Azerbaijan** has been about the traps as 303-IR/0 and will remain on air until December 31. The QSL route will be announced on air during the operation.

**Estonia** will be near the end of the 304-SD/0 operation due to conclude on December 31. QSL direct to PO Box 615, Castellon 12080, Spain.

**Albania** by way of 251-DT/0 will also conclude on December 31, so there's little time left to secure this one for those who need it. QSL to PO Box 15, Chef 79110, France.

**United Nations Geneva** was scheduled for operation possibly in November or December, although sound dates were yet to be established as this went to press. The callsign of 235-IR/0 is to be used, and those with internet facilities should keep an eye on the International Radio group home page.

**Pakistan** should have appeared on air November 1 as 114-MRC-002 with the operation running through to November 1, 1998. Plenty of time to track this one down! The station is said to be located in Karachi. QSL to PO Box 201, Loirent 56102, France.

**Rwanda** is active now and will conclude sometime in February 1998 by way of 227-IR/0 operated by Clark. QSL cards go with all the trimmings via PO Box 07, Malissard 26120, France.

**Madeira Islands** will conclude operation on December 31 signing as 119-FU/DX after being active for many weeks. QSL cards go to PO Box 4902, Haarlem 2003 EX, The Netherlands.

**Lord Howe Island** is still on the cards around the time you read this or early in 1998 with a planned operation by Tommy 43-IR-001 from Sydney. Tommy will sign as 268-IR/0 and requests cards go with the usual trimmings via PO Box 191, Sans Souci, NSW 2219.

The Charlie Tango group has the following stations on air now and due to close December 31: **Austria** 35-CT/DX, **Malta** 93-CT/DX, **Liechtenstein** 40-CT/DX and finally **Poland** as 161-CT/DX. QSL routes given on air to various addresses.

**Svalbard** is one to watch for; a couple of DXers in Queensland have already worked this one signing as 171-AT/DX. The operation will close down on June 30, 1998, so there's still plenty of time for those in the southern states to have a bite at the proverbial cherry! QSL to PO Box 35, Gdansk 37-80 325, Poland.

# Online 1998

***Michael Evans starts the year by looking at a variety of commercial two-way radio trunking systems...***

One of the most popular trunking protocols in use in Australia today is the MPT 1327/1343 universal trunking protocol. There are numerous commercial carriers offering this style of trunking system, the beauty of which is that the equipment is available from numerous suppliers, which means you are not tied to a particular manufacturer.

The protocol allows for users to set up telephone interconnection, whether that be from their own PABX system (which allows the mobile to be contacted just like an internal telephone extension) through to the mobiles having the ability to be either dialled direct from the Public Switched Telephone Network or make outbound telephone calls to the rest of the world via their mobile or portable radio when fitted with a DTMF keypad.

MPT 1327/1343 allows also for Short Data Messaging (SDM) to be sent direct to the LCD display of the radio, and also Status Codes can be set up so that a radio operator can simply press a button and that in turn sends a signal to their dispatcher's console to indicate that they may be out of the car, for example. All of these features can be programmed on a Fleet by Fleet basis.

One of the biggest MPT 1327/1343 trunking networks in Victoria is the original Victorian Government network that is now owned and administered by Telstra and marketed under the name of **Telstra StateNet**. This currently operates in the VHF high band. Although originally set up to serve the needs of government bodies in Victoria, it is now available to the public sector as well, making it an attractive proposition for companies that do work right across the State of Victoria.

This network has to be heard to be believed — when put together largely with the assistance of sites provided by Department of Conservation, Police, State Electricity Commission and Telstra, it has the pick of the very best sites through the state, and therefore provides truly excellent coverage.

Those fellow Victorians may recall that it was this very network being implemented that caused the chaos and massive restructuring of all services previously in the VHF high band by the then-named Spectrum Management Agency (now Australian Communications Agency). The change to 12.5 kHz spacing instead of the original 25 and 30 kHz spacing previously used at VHF was necessary due to the huge number of channels required to accommodate it.

Although heavily populated by Victorian State Government departments and utilities, it is also available to commercial users if they want it. The channel/frequency plan for this network is shown at right in **Table 1**.

Yes, the channel plan as I have listed is indeed correct, with the first channel currently used being Channel 142. This particular network does not commence its active frequency table at Channel 1 as many (all right, *most*) of them do.

The users of this network are extensive ranging from numerous government users such as the Victoria power companies, Department of Natural Resources and Environment, Victorian Roads Corporation, local councils and Telstra Corporation through to commercial users such as television stations, communications companies and private schools, just to name a few. This is a very busy and very extensive network covering most parts of Victoria.

Another network operated by Telstra, but this time operating right across the major states in Australia, is the **Telstra Fleetscom** system, which operates in the UHF band. This network also has a number of government departments on it, but is heavily populated by commercial users. Its channel allocations are shown in **Table 2**.

This network is predominantly used by commercial users, however Telstra VisionStream (the cable TV arm of Telstra) is an extensive user of the network, as well as towing companies, Radio Rentals, taxi & courier companies, window shutter companies, doctors and medical transport companies. The Telstra Fleetscom Network is also an extremely busy system, so it should be very easy to find an active channel near you.

**Radio Technologies** in Victoria has set up an impressive VHF trunking network using the same MPT 1327/1343 system protocol. This system is marketed under the name of **BISCOM**, and it has a large customer base from the private and commercial sector utilising its services. **Table 3** lists the BISCOM channels.

Although not as big and not as heavily populated as the government networks, BISCOM is an extremely well put-together network with a good solid grounding of commercial customers. It has customers from the security industry, couriers and transport companies, just to name a few. If you are interested in how trunking works, then this is another good network to take a peek at.

The **Victorian Public Transport Corporation** which runs the trams and trains around Melbourne also has its own private trunking network, and its channels are shown in **Table 4**.

You will hear a lot of train shunting going on while monitoring this network. The control tower will speak to numerous trains and personnel on the tracks to arrange for trains to be shuffled around within the yards at Jolimont, Spencer and Flinders Street stations.

## Hear it at home...

All of the previously mentioned networks use the MPT 1327/1343 protocol, and the best way to monitor those and display the data — and, indeed, to be able to follow a complete conversation — is by using the **FTRUNK** decoder package.

The package consists of a Windows-based piece of software and a special MSK modem interface which connects between the PC's serial port and the audio output of your scanner tuned into the relevant data channel. Extensive work has been done on the software for the inclusion of all of the above networks into the channel table plans, so you can actually display the frequencies on screen as well.

The MPT protocol does not ever transmit over the air the frequency information, just a channel number. The FTRUNK software, when used in conjunction with something like the OptoElectronics Optolinx interface, allows you to 'reaction tune' your Icom CI-V compliant receiver to either follow a particular fleet, or it can even be narrowed down to a particular mobile or portable to follow the conversations from it to the exclusion of anything else... the software is *that* configurable and powerful.

The package costs $320 plus postage and insurance, and has been sold to New Zealand, South Africa, Korea, America and the UK. While the software was written by Ian Wraith in the UK, the hardware is assembled in Melbourne. If you would like more information on this package and you have an Internet account, take a look at **http://www.tbsa.com.au/trunk.html** or send an email to **mpt1327@tbsa.com.au**.

## Other systems

Without a doubt, one of the most popular trunking networks around Australia in the major capital cities would have to be Motorola's proprietary **SmartNet** trunking system, which operates in the 800MHz band. This network uses a very complicated protocol developed by Motorola and is highly spectrum efficient and able to cope with high usage demands.

In Melbourne the users range from security companies, courier companies, doctors, caterers, towing companies and fleet transporters, just to name a few. This network is extremely busy during the day, and is still heavily populated at night as the security companies pop up on air. The release of the Bearcat Trunk Tracker

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series of scanners was heralded as a major breakthrough in the monitoring of the Motorola SmartNet system overseas, however it has yet to be released in Australia, and there is some doubt that these scanners ever will be, as they would require a unique Oz-only model to work with the system utilised here.

Fear not, there is a program available off the internet called **TRUNKER.EXE** that decodes the data channel from a Motorola system and displays it on your PC. If you have an AR AOR-8000 scanner handy as well, you can get Trunker to control that and act as a pseudo tracking system for this network via a special cable and your PC's serial port. The Trunker software is well worth a look if you want to get an idea on how this network operates.

The Motorola system actually transmits over the data channel the frequencies to go to rather than just a channel number, so the software makes it easy to see exactly what frequencies are being used and re-used on any one particular base station. The SmartNet channel plan for Australia is shown in **Table 5**.

Now before you jump at me and say "...but hey, Motorola doesn't use all of those...", be assured that you are indeed correct — it doesn't. The channel allocations are handled by the trunk controller computer associated with each base station, so if it is not licensed to use a certain range of channels, then they simply are *not* programmed into the base station for actual use.

These are only two of the several types of trunking systems in use here at the present time. There are others in use — the Ericsson EDACS system adopted by the Tasmanian Government for its state-wide network is one example. Not a lot is known about that here as yet, but as more information on how it works becomes available I shall attempt to keep you all informed. An introductory article was published in this magazine a couple of months ago. The TETRA Digital trunking will also be a new player to keep an eye on as that starts up in the major capitals as well.

Well there you have it, an in-depth look at the trunking scenario in Australia at present. If you have some other channel plan information to contribute relating to another network in use here in Australia or New Zealand, by all means drop me a line and I shall be only to happy to share the information with other like-minded souls. You can send your information via the 'Net to **michael@tbsa.com.au** or through the traditional snail mail to PO Box 8054, Northland Centre, Victoria 3072.

| Ch. | Freq |
|---|---|
| 142 | 163.8250 |
| 143 | 163.8375 |
| 144 | 163.8500 |
| 145 | 163.8625 |
| 146 | 163.8750 |
| 147 | 163.8875 |
| 148 | 163.9000 |
| 149 | 163.9125 |
| 150 | 163.9250 |
| 151 | 163.9375 |
| 152 | 163.9500 |
| 153 | 163.9625 |
| 154 | 163.9750 |
| 155 | 163.9875 |
| 156 | 164.0000 |
| 157 | 164.0125 |
| 158 | 164.0250 |
| 159 | 164.0375 |
| 160 | 164.0500 |
| 161 | 164.0625 |
| 162 | 164.0750 |
| 163 | 164.0875 |
| 164 | 164.1000 |
| 165 | 164.1125 |
| 166 | 164.1250 |
| 167 | 164.1375 |
| 168 | 164.1500 |
| 169 | 164.1625 |
| 170 | 164.1750 |
| 171 | 164.1875 |
| 172 | 164.2000 |
| 173 | 164.2125 |
| 174 | 164.2250 |
| 175 | 164.2375 |
| 176 | 164.2500 |
| 177 | 164.2625 |
| 178 | 164.2750 |
| 179 | 164.2875 |
| 180 | 164.3000 |
| 181 | 164.3125 |
| 182 | 164.3250 |
| 183 | 164.3375 |
| 184 | 164.3500 |
| 185 | 164.3625 |
| 186 | 164.3750 |
| 187 | 164.3875 |
| 188 | 164.4000 |
| 189 | 164.4125 |
| 190 | 164.4250 |
| 191 | 164.4375 |
| 192 | 164.4500 |
| 193 | 164.4625 |
| 194 | 164.4750 |
| 195 | 164.4875 |
| 196 | 164.5000 |
| 197 | 164.5125 |
| 198 | 164.5250 |
| 199 | 164.5375 |
| 200 | 164.5500 |
| 201 | 164.5625 |
| 202 | 164.5750 |
| 203 | 164.5875 |
| 204 | 164.6000 |
| 205 | 164.6125 |
| 206 | 164.6250 |
| 207 | 164.6375 |
| 208 | 164.6500 |
| 209 | 164.6625 |
| 210 | 164.6750 |
| 211 | 164.6875 |
| 212 | 164.7000 |
| 213 | 164.7125 |
| 214 | 164.7250 |
| 215 | 164.7375 |
| 216 | 164.7500 |
| 217 | 164.7625 |
| 218 | 164.7750 |
| 219 | 164.7875 |
| 220 | 164.8000 |
| 221 | 164.8125 |
| 222 | 164.8250 |
| 223 | 164.8375 |
| 224 | 164.8500 |
| 225 | 164.8625 |
| 226 | 164.8750 |
| 227 | 164.8875 |
| 228 | 164.9000 |
| 229 | 164.9125 |
| 230 | 164.9250 |
| 231 | 164.9375 |
| 232 | 164.9500 |
| 233 | 164.9625 |
| 234 | 164.9750 |
| 235 | 164.9875 |
| 236 | 165.0000 |
| 237 | 165.0125 |
| 238 | 165.0250 |
| 239 | 165.0375 |
| 240 | 165.0500 |
| 241 | 165.0625 |
| 242 | 165.0750 |
| 243 | 165.0875 |
| 244 | 165.1000 |
| 245 | 165.1125 |
| 246 | 165.1250 |
| 247 | 165.1375 |
| 248 | 165.1500 |
| 249 | 165.1625 |
| 250 | 165.1750 |
| 251 | 165.1875 |

**Table 1**

| Ch. | Freq |
|---|---|
| 1 | 415.5750 |
| 2 | 415.5875 |
| 3 | 415.6000 |
| 4 | 415.6125 |
| 5 | 415.6250 |
| 6 | 415.6375 |
| 7 | 415.6500 |
| 8 | 415.6625 |
| 9 | 415.6750 |
| 10 | 415.6875 |
| 11 | 415.7000 |
| 12 | 415.7125 |
| 13 | 415.7250 |
| 14 | 415.7375 |
| 15 | 415.7500 |
| 16 | 415.7625 |
| 17 | 415.7750 |
| 18 | 415.7875 |
| 19 | 415.8000 |
| 20 | 415.8125 |
| 21 | 415.8250 |
| 22 | 415.8375 |
| 23 | 415.8500 |
| 24 | 415.8625 |
| 25 | 415.8750 |
| 26 | 415.8875 |
| 27 | 415.9000 |
| 28 | 415.9125 |
| 29 | 415.9250 |
| 30 | 415.9375 |
| 31 | 415.9500 |
| 32 | 415.9625 |
| 33 | 415.9750 |
| 34 | 415.9875 |
| 35 | 416.0000 |
| 36 | 416.0125 |
| 37 | 416.0250 |
| 38 | 416.0375 |
| 39 | 416.0500 |
| 40 | 416.0625 |
| 41 | 416.0750 |
| 42 | 416.0875 |
| 43 | 416.1000 |
| 44 | 416.1125 |
| 45 | 416.1250 |
| 46 | 416.1375 |
| 47 | 416.1500 |
| 48 | 416.1625 |
| 49 | 416.1750 |
| 50 | 416.1875 |
| 51 | 416.2000 |
| 52 | 416.2125 |
| 53 | 416.2250 |
| 54 | 416.2375 |
| 55 | 416.2500 |
| 56 | 416.2625 |
| 57 | 416.2750 |
| 58 | 416.2875 |
| 59 | 416.3000 |
| 60 | 416.3125 |
| 61 | 416.3250 |
| 62 | 416.3375 |
| 63 | 416.3500 |
| 64 | 416.3625 |
| 65 | 416.3750 |
| 66 | 416.3875 |
| 67 | 416.4000 |
| 68 | 416.4125 |
| 69 | 416.4250 |
| 70 | 416.4375 |
| 71 | 416.4500 |
| 72 | 416.4625 |
| 73 | 416.4750 |
| 74 | 416.4875 |
| 75 | 416.5000 |
| 76 | 416.5125 |
| 77 | 416.5250 |
| 78 | 416.5375 |
| 79 | 416.5500 |
| 80 | 416.5625 |
| 81 | 416.5750 |
| 82 | 416.5875 |
| 83 | 416.6000 |
| 84 | 416.6125 |
| 85 | 416.6250 |
| 86 | 416.6375 |
| 87 | 416.6500 |
| 88 | 416.6625 |
| 89 | 416.6750 |
| 90 | 416.6875 |
| 91 | 416.7000 |
| 92 | 416.7125 |
| 93 | 416.7250 |
| 94 | 416.7375 |
| 95 | 416.7500 |
| 96 | 416.7625 |
| 97 | 416.7750 |
| 98 | 416.7875 |
| 99 | 416.8000 |
| 100 | 416.8125 |
| 101 | 416.8250 |
| 102 | 416.8375 |
| 103 | 416.8500 |
| 104 | 416.8625 |
| 105 | 416.8750 |
| 106 | 416.8875 |
| 107 | 416.9000 |
| 108 | 416.9125 |
| 109 | 416.9250 |
| 110 | 416.9375 |
| 111 | 416.9500 |
| 112 | 416.9625 |
| 113 | 416.9750 |
| 114 | 416.9875 |
| 115 | 417.0000 |
| 116 | 417.0125 |
| 117 | 417.0250 |
| 118 | 417.0375 |
| 119 | 417.0500 |
| 120 | 417.0625 |
| 121 | 417.0750 |
| 122 | 417.0875 |
| 123 | 417.1000 |
| 124 | 417.1125 |
| 125 | 417.1250 |
| 126 | 417.1375 |
| 127 | 417.1500 |
| 128 | 417.1625 |
| 129 | 417.1750 |
| 130 | 417.1875 |
| 131 | 417.2000 |
| 132 | 417.2125 |
| 133 | 417.2250 |
| 134 | 417.2375 |
| 135 | 417.2500 |
| 136 | 417.2625 |
| 137 | 417.2750 |
| 138 | 417.2875 |
| 139 | 417.3000 |
| 140 | 417.3125 |
| 141 | 417.3250 |
| 142 | 417.3375 |
| 143 | 417.3500 |
| 144 | 417.3625 |
| 145 | 417.3750 |
| 146 | 417.3875 |
| 147 | 417.4000 |
| 148 | 417.4125 |
| 149 | 417.4250 |
| 150 | 417.4375 |
| 151 | 417.4500 |
| 152 | 417.4625 |
| 153 | 417.4750 |
| 154 | 417.4875 |
| 155 | 417.5000 |
| 156 | 417.5125 |
| 157 | 417.5250 |
| 158 | 417.5375 |
| 159 | 417.5500 |
| 160 | 417.5625 |
| 161 | 417.5750 |
| 162 | 417.5875 |
| 163 | 417.6000 |
| 164 | 417.6125 |
| 165 | 417.6250 |
| 166 | 417.6375 |
| 167 | 417.6500 |

| Ch. | Freq |
|---|---|
| 168 | 417.6625 |
| 169 | 417.6750 |
| 170 | 417.6875 |
| 171 | 417.7000 |
| 172 | 417.7125 |
| 173 | 417.7250 |
| 174 | 417.7375 |
| 175 | 417.7500 |
| 176 | 417.7625 |
| 177 | 417.7750 |
| 178 | 417.7875 |
| 179 | 417.8000 |
| 180 | 417.8125 |
| 181 | 417.8250 |
| 182 | 417.8375 |
| 183 | 417.8500 |
| 184 | 417.8625 |
| 185 | 417.8750 |
| 186 | 417.8875 |
| 187 | 417.9000 |
| 188 | 417.9125 |
| 189 | 417.9250 |
| 190 | 417.9375 |
| 191 | 417.9500 |
| 192 | 417.9625 |
| 193 | 417.9750 |
| 194 | 417.9875 |
| 195 | 418.0000 |
| 196 | 418.0125 |
| 197 | 418.0250 |
| 198 | 418.0375 |
| 199 | 418.0500 |
| 200 | 418.0625 |
| 201 | 418.0750 |
| 202 | 418.0875 |
| 203 | 418.1000 |
| 204 | 418.1125 |
| 205 | 418.1250 |
| 206 | 418.1375 |
| 207 | 418.1500 |
| 208 | 418.1625 |
| 209 | 418.1750 |
| 210 | 418.1875 |
| 211 | 418.2000 |
| 212 | 418.2125 |
| 213 | 418.2250 |
| 214 | 418.2375 |
| 215 | 418.2500 |
| 216 | 418.2625 |
| 217 | 418.2750 |
| 218 | 418.2875 |
| 219 | 418.3000 |
| 220 | 418.3125 |
| 221 | 418.3250 |
| 222 | 418.3375 |
| 223 | 418.3500 |
| 224 | 418.3625 |
| 225 | 418.3750 |
| 226 | 418.3875 |
| 227 | 418.4000 |
| 228 | 418.4125 |
| 229 | 418.4250 |
| 230 | 418.4375 |
| 231 | 418.4500 |
| 232 | 418.4625 |
| 233 | 418.4750 |
| 234 | 418.4875 |
| 235 | 418.5000 |
| 236 | 418.5125 |
| 237 | 418.5250 |
| 238 | 418.5375 |
| 239 | 418.5500 |
| 240 | 418.5625 |
| 241 | 418.5750 |
| 242 | 418.5875 |
| 243 | 418.6000 |
| 244 | 418.6125 |
| 245 | 418.6250 |
| 246 | 418.6375 |
| 247 | 418.6500 |
| 248 | 418.6625 |
| 249 | 418.6750 |
| 250 | 418.6875 |
| 251 | 418.7000 |
| 252 | 418.7125 |
| 253 | 418.7250 |
| 254 | 418.7375 |
| 255 | 418.7500 |
| 256 | 418.7625 |
| 257 | 418.7750 |
| 258 | 418.7875 |
| 259 | 418.8000 |
| 260 | 418.8125 |
| 261 | 418.8250 |
| 262 | 418.8375 |
| 263 | 418.8500 |
| 264 | 418.8625 |
| 265 | 418.8750 |
| 266 | 418.8875 |
| 267 | 418.9000 |
| 268 | 418.9125 |
| 269 | 418.9250 |
| 270 | 418.9375 |
| 271 | 418.9500 |
| 272 | 418.9625 |
| 273 | 418.9750 |
| 274 | 418.9875 |
| 275 | 419.0000 |
| 276 | 419.0125 |
| 277 | 419.0250 |
| 278 | 419.0375 |
| 279 | 419.0500 |
| 280 | 419.0625 |
| 281 | 419.0750 |
| 282 | 419.0875 |
| 283 | 419.1000 |
| 284 | 419.1125 |
| 285 | 419.1250 |
| 286 | 419.1375 |
| 287 | 419.1500 |
| 288 | 419.1625 |
| 289 | 419.1750 |
| 290 | 419.1875 |
| 291 | 419.2000 |
| 292 | 419.2125 |
| 293 | 419.2250 |
| 294 | 419.2375 |
| 295 | 419.2500 |
| 296 | 419.2625 |
| 297 | 419.2750 |
| 298 | 419.2875 |
| 299 | 419.3000 |
| 300 | 419.3125 |
| 301 | 419.3250 |
| 302 | 419.3375 |
| 303 | 419.3500 |
| 304 | 419.3625 |
| 305 | 419.3750 |
| 306 | 419.3875 |
| 307 | 419.4000 |
| 308 | 419.4125 |
| 309 | 419.4250 |
| 310 | 419.4375 |
| 311 | 419.4500 |
| 312 | 419.4625 |
| 313 | 419.4750 |
| 314 | 419.4875 |
| 315 | 419.5000 |
| 316 | 419.5125 |
| 317 | 419.5250 |
| 318 | 419.5375 |
| 319 | 419.5500 |
| 320 | 419.5625 |
| 321 | 419.5750 |
| 322 | 419.5875 |
| 323 | 419.6000 |
| 324 | 419.6125 |
| 325 | 419.6250 |
| 326 | 419.6375 |
| 327 | 419.6500 |
| 328 | 419.6625 |
| 329 | 419.6750 |
| 330 | 419.6875 |
| 331 | 419.7000 |
| 332 | 419.7125 |
| 333 | 419.7250 |
| 334 | 419.7375 |
| 335 | 419.7500 |
| 336 | 419.7625 |
| 337 | 419.7750 |
| 338 | 419.7875 |
| 339 | 419.8000 |
| 340 | 419.8125 |
| 341 | 419.8250 |
| 342 | 419.8375 |
| 343 | 419.8500 |
| 344 | 419.8625 |
| 345 | 419.8750 |
| 346 | 419.8875 |
| 347 | 419.9000 |
| 348 | 419.9125 |
| 349 | 419.9250 |
| 350 | 419.9375 |
| 351 | 419.9500 |
| 352 | 419.9625 |
| 353 | 419.9750 |
| 354 | 419.9875 |

**Table 2**

| Ch. | Freq |
|---|---|
| 1 | 165.2000 |
| 2 | 165.2125 |
| 3 | 165.2250 |
| 4 | 165.2375 |
| 5 | 165.2500 |
| 6 | 165.2625 |
| 7 | 165.2750 |
| 8 | 165.2875 |
| 9 | 165.3000 |
| 10 | 165.3125 |
| 11 | 165.3250 |
| 12 | 165.3375 |
| 13 | 165.3500 |
| 14 | 165.3625 |
| 15 | 165.3750 |
| 16 | 165.3875 |
| 17 | 165.4000 |
| 18 | 165.4125 |
| 19 | 165.4250 |
| 20 | 165.4375 |
| 21 | 165.4500 |
| 22 | 165.4625 |
| 23 | 165.4750 |
| 24 | 165.4875 |
| 25 | 165.5000 |
| 26 | 165.5125 |
| 27 | 165.5250 |
| 28 | 165.5375 |
| 29 | 165.5500 |
| 30 | 165.5625 |
| 31 | 165.5750 |
| 32 | 165.5875 |
| 33 | 165.6000 |
| 34 | 165.6125 |
| 35 | 165.6250 |
| 36 | 165.6375 |
| 37 | 165.6500 |
| 38 | 165.6625 |
| 39 | 165.6750 |
| 40 | 165.6875 |
| 41 | 165.7000 |
| 42 | 165.7125 |
| 43 | 165.7250 |
| 44 | 165.7375 |
| 45 | 165.7500 |
| 46 | 165.7625 |
| 47 | 165.7750 |
| 48 | 165.7875 |
| 49 | 165.8000 |
| 50 | 165.8125 |
| 51 | 165.8250 |
| 52 | 165.8375 |
| 53 | 165.8500 |
| 54 | 165.8625 |
| 55 | 165.8750 |
| 56 | 165.8875 |
| 57 | 165.9000 |
| 58 | 165.9125 |
| 59 | 165.9250 |
| 60 | 165.9375 |
| 61 | 165.9500 |
| 62 | 165.9625 |
| 63 | 165.9750 |
| 64 | 165.9875 |
| 65 | 166.0000 |
| 66 | 166.0125 |
| 67 | 166.0250 |
| 68 | 166.0375 |
| 69 | 166.0500 |
| 70 | 166.0625 |
| 71 | 166.0750 |
| 72 | 166.0875 |
| 73 | 166.1000 |
| 74 | 166.1125 |
| 75 | 166.1250 |
| 76 | 166.1375 |
| 77 | 166.1500 |
| 78 | 166.1625 |
| 79 | 166.1750 |
| 80 | 166.1875 |
| 81 | 166.2000 |
| 82 | 166.2125 |
| 83 | 166.2250 |
| 84 | 166.2375 |
| 85 | 166.2500 |
| 86 | 166.2625 |
| 87 | 166.2750 |
| 88 | 166.2875 |
| 89 | 166.3000 |
| 90 | 166.3125 |
| 91 | 166.3250 |
| 92 | 166.3375 |
| 93 | 166.3500 |
| 94 | 166.3625 |
| 95 | 166.3750 |
| 96 | 166.3875 |
| 97 | 166.4000 |
| 98 | 166.4125 |
| 99 | 166.4250 |
| 100 | 166.4375 |
| 101 | 166.4500 |
| 102 | 166.4625 |
| 103 | 166.4750 |
| 104 | 166.4875 |
| 105 | 166.5000 |
| 106 | 166.5125 |
| 107 | 166.5250 |
| 108 | 166.5375 |
| 109 | 166.5500 |
| 110 | 166.5625 |
| 111 | 166.5750 |
| 112 | 166.5875 |
| 113 | 166.6000 |
| 114 | 166.6125 |
| 115 | 166.6250 |
| 116 | 166.6375 |
| 117 | 166.6500 |
| 118 | 166.6625 |
| 119 | 166.6750 |
| 120 | 166.6875 |
| 121 | 166.7000 |
| 122 | 166.7125 |
| 123 | 166.7250 |
| 124 | 166.7375 |
| 125 | 166.7500 |
| 126 | 166.7625 |
| 127 | 166.7750 |
| 128 | 166.7875 |
| 129 | 166.8000 |
| 130 | 166.8125 |
| 131 | 166.8250 |
| 132 | 166.8375 |
| 133 | 166.8500 |
| 134 | 166.8625 |
| 135 | 166.8750 |
| 136 | 166.8875 |
| 137 | 166.9000 |
| 138 | 166.9125 |
| 139 | 166.9250 |
| 140 | 166.9375 |
| 141 | 166.9500 |
| 142 | 166.9625 |
| 143 | 166.9750 |
| 144 | 166.9875 |
| 145 | 167.0000 |
| 146 | 167.0125 |
| 147 | 167.0250 |
| 148 | 167.0375 |
| 149 | 167.0500 |
| 150 | 167.0625 |
| 151 | 167.0750 |
| 152 | 167.0875 |
| 153 | 167.1000 |
| 154 | 167.1125 |
| 155 | 167.1250 |
| 156 | 167.1375 |
| 157 | 167.1500 |
| 158 | 167.1625 |
| 159 | 167.1750 |
| 160 | 167.1875 |
| 161 | 167.2000 |
| 162 | 167.2125 |
| 163 | 167.2250 |
| 164 | 167.2375 |
| 165 | 167.2500 |
| 166 | 167.2625 |
| 167 | 167.2750 |
| 168 | 167.2875 |
| 169 | 167.3000 |
| 170 | 167.3125 |
| 171 | 167.3250 |
| 172 | 167.3375 |
| 173 | 167.3500 |
| 174 | 167.3625 |
| 175 | 167.3750 |
| 176 | 167.3875 |
| 177 | 167.4000 |
| 178 | 167.4125 |
| 179 | 167.4250 |
| 180 | 167.4375 |
| 181 | 167.4500 |
| 182 | 167.4625 |
| 183 | 167.4750 |
| 184 | 167.4875 |
| 185 | 167.5000 |
| 186 | 167.5125 |
| 187 | 167.5250 |
| 188 | 167.5375 |
| 189 | 167.5500 |
| 190 | 167.5625 |
| 191 | 167.5750 |
| 192 | 167.5875 |
| 193 | 167.6000 |
| 194 | 167.6125 |
| 195 | 167.6250 |
| 196 | 167.6375 |
| 197 | 167.6500 |
| 198 | 167.6625 |
| 199 | 167.6750 |
| 200 | 167.6875 |
| 201 | 167.7000 |
| 202 | 167.7125 |
| 203 | 167.7250 |
| 204 | 167.7375 |
| 205 | 167.7500 |
| 206 | 167.7625 |
| 207 | 167.7750 |
| 208 | 167.7875 |
| 209 | 167.8000 |
| 210 | 167.8125 |
| 211 | 167.8250 |
| 212 | 167.8375 |
| 213 | 167.8500 |
| 214 | 167.8625 |
| 215 | 167.8750 |
| 216 | 167.8875 |
| 217 | 167.9000 |
| 218 | 167.9125 |
| 219 | 167.9250 |
| 220 | 167.9375 |
| 221 | 167.9500 |
| 222 | 167.9625 |
| 223 | 167.9750 |
| 224 | 167.9875 |
| 225 | 168.0000 |
| 226 | 168.0125 |
| 227 | 168.0250 |
| 228 | 168.0375 |
| 229 | 168.0500 |

**Table 3**

| Ch... | Freq |
|---|---|
| 1..... | 414.500 |
| 2..... | 414.525 |
| 3..... | 414.550 |
| 4..... | 414.575 |
| 5..... | 414.600 |
| 6..... | 414.625 |
| 7..... | 414.650 |
| 8..... | 414.675 |
| 9..... | 414.700 |
| 10.... | 414.725 |
| 11.... | 414.750 |
| 12.... | 414.775 |
| 13.... | 414.800 |
| 14.... | 414.825 |
| 15.... | 414.850 |
| 16.... | 414.875 |
| 17.... | 414.900 |
| 18.... | 414.925 |
| 19.... | 414.950 |
| 20.... | 414.975 |
| 21.... | 415.000 |
| 22.... | 415.025 |
| 23.... | 415.050 |
| 24.... | 415.075 |
| 25.... | 415.100 |
| 26.... | 415.125 |
| 27.... | 415.150 |
| 28.... | 415.175 |
| 29.... | 415.200 |
| 30.... | 415.225 |
| 31.... | 415.250 |
| 32.... | 415.275 |
| 33.... | 415.300 |
| 34.... | 415.325 |
| 35.... | 415.350 |
| 36.... | 415.375 |
| 37.... | 415.400 |
| 38.... | 415.425 |
| 39.... | 415.450 |
| 40.... | 415.475 |
| 41.... | 415.500 |
| 42.... | 415.525 |
| 43.... | 415.550 |
| 44.... | 415.575 |
| 45.... | 415.600 |
| 46.... | 415.625 |
| 47.... | 415.650 |
| 48.... | 415.675 |
| 49.... | 415.700 |
| 50.... | 415.725 |

**Table 4**

| Ch... | Freq |
|---|---|
| 560... | 865.0125 |
| 561... | 865.0375 |
| 562... | 865.0625 |
| 563... | 865.0875 |
| 564... | 865.1125 |
| 565... | 865.1375 |
| 566... | 865.1625 |
| 567... | 865.1875 |
| 568... | 865.2125 |
| 569... | 865.2375 |
| 570... | 865.2625 |
| 571... | 865.2875 |
| 572... | 865.3125 |
| 573... | 865.3375 |
| 574... | 865.3625 |
| 575... | 865.3875 |
| 576... | 865.4125 |
| 577... | 865.4375 |
| 578... | 865.4625 |
| 579... | 865.4875 |
| 580... | 865.5125 |
| 581... | 865.5375 |
| 582... | 865.5625 |
| 583... | 865.5875 |
| 584... | 865.6125 |
| 585... | 865.6375 |
| 586... | 865.6625 |
| 587... | 865.6875 |
| 588... | 865.7125 |
| 589... | 865.7375 |
| 590... | 865.7625 |
| 591... | 865.7875 |
| 592... | 865.8125 |
| 593... | 865.8375 |
| 594... | 865.8625 |
| 595... | 865.8875 |
| 596... | 865.9125 |
| 597... | 865.9375 |
| 598... | 865.9625 |
| 599... | 865.9875 |
| 600... | 866.0125 |
| 601... | 866.0375 |
| 602... | 866.0625 |
| 603... | 866.0875 |
| 604... | 866.1125 |
| 605... | 866.1375 |
| 606... | 866.1625 |
| 607... | 866.1875 |
| 608... | 866.2125 |
| 609... | 866.2375 |
| 610... | 866.2625 |
| 611... | 866.2875 |
| 612... | 866.3125 |
| 613... | 866.3375 |
| 614... | 866.3625 |
| 615... | 866.3875 |
| 616... | 866.4125 |
| 617... | 866.4375 |
| 618... | 866.4625 |
| 619... | 866.4875 |
| 620... | 866.5125 |
| 621... | 866.5375 |
| 622... | 866.5625 |
| 623... | 866.5875 |
| 624... | 866.6125 |
| 625... | 866.6375 |
| 626... | 866.6625 |
| 627... | 866.6875 |
| 628... | 866.7125 |
| 629... | 866.7375 |
| 630... | 866.7625 |
| 631... | 866.7875 |
| 632... | 866.8125 |
| 633... | 866.8375 |
| 634... | 866.8625 |
| 635... | 866.8875 |
| 636... | 866.9125 |
| 637... | 866.9375 |
| 638... | 866.9625 |
| 639... | 866.9875 |
| 640... | 867.0125 |
| 641... | 867.0375 |
| 642... | 867.0625 |
| 643... | 867.0875 |
| 644... | 867.1125 |
| 645... | 867.1375 |
| 646... | 867.1625 |
| 647... | 867.1875 |
| 648... | 867.2125 |
| 649... | 867.2375 |
| 650... | 867.2625 |
| 651... | 867.2875 |
| 652... | 867.3125 |
| 653... | 867.3375 |
| 654... | 867.3625 |
| 655... | 867.3875 |
| 656... | 867.4125 |
| 657... | 867.4375 |
| 658... | 867.4625 |
| 659... | 867.4875 |
| 660... | 867.5125 |
| 661... | 867.5375 |
| 662... | 867.5625 |
| 663... | 867.5875 |
| 664... | 867.6125 |
| 665... | 867.6375 |
| 666... | 867.6625 |
| 667... | 867.6875 |
| 668... | 867.7125 |
| 669... | 867.7375 |
| 670... | 867.7625 |
| 671... | 867.7875 |
| 672... | 867.8125 |
| 673... | 867.8375 |
| 674... | 867.8625 |
| 675... | 867.8875 |
| 676... | 867.9125 |
| 677... | 867.9375 |
| 678... | 867.9625 |
| 679... | 867.9875 |
| 680... | 868.0125 |
| 681... | 868.0375 |
| 682... | 868.0625 |
| 683... | 868.0875 |
| 684... | 868.1125 |
| 685... | 868.1375 |
| 686... | 868.1625 |
| 687... | 868.1875 |
| 688... | 868.2125 |
| 689... | 868.2375 |
| 690... | 868.2625 |
| 691... | 868.2875 |
| 692... | 868.3125 |
| 693... | 868.3375 |
| 694... | 868.3625 |
| 695... | 868.3875 |
| 696... | 868.4125 |
| 697... | 868.4375 |
| 698... | 868.4625 |
| 699... | 868.4875 |
| 700... | 868.5125 |
| 701... | 868.5375 |
| 702... | 868.5625 |
| 703... | 868.5875 |
| 704... | 868.6125 |
| 705... | 868.6375 |
| 706... | 868.6625 |
| 707... | 868.6875 |
| 708... | 868.7125 |
| 709... | 868.7375 |
| 710... | 868.7625 |
| 711... | 868.7875 |
| 712... | 868.8125 |
| 713... | 868.8375 |
| 714... | 868.8625 |
| 715... | 868.8875 |
| 716... | 868.9125 |
| 717... | 868.9375 |
| 718... | 868.9625 |
| 719... | 868.9875 |
| 720... | 869.0125 |
| 721... | 869.0375 |
| 722... | 869.0625 |
| 723... | 869.0875 |
| 724... | 869.1125 |
| 725... | 869.1375 |
| 726... | 869.1625 |
| 727... | 869.1875 |
| 728... | 869.2125 |
| 729... | 869.2375 |
| 730... | 869.2625 |
| 731... | 869.2875 |
| 732... | 869.3125 |
| 733... | 869.3375 |
| 734... | 869.3625 |
| 735... | 869.3875 |
| 736... | 869.4125 |
| 737... | 869.4375 |
| 738... | 869.4625 |
| 739... | 869.4875 |
| 740... | 869.5125 |
| 741... | 869.5375 |
| 742... | 869.5625 |
| 743... | 869.5875 |
| 744... | 869.6125 |
| 745... | 869.6375 |
| 746... | 869.6625 |
| 747... | 869.6875 |
| 748... | 869.7125 |
| 749... | 869.7375 |
| 750... | 869.7625 |
| 751... | 869.7875 |
| 752... | 869.8125 |
| 753... | 869.8375 |
| 754... | 869.8625 |
| 755... | 869.8875 |
| 756... | 869.9125 |
| 757... | 869.9375 |

**Table 5**

## Legend of Tables

**Table 1:** **Telstra StateNet**. VHF. As used in Victoria, mainly by government.
**Table 2:** **Telstra Fleetscom**. UHF. Used nation-wide; lots of commercial users.
**Table 3:** The **BISCOM** network, as used in Victoria by commercial users.
**Table 4:** The **Victorian Public Transport Corporation** private network.
**Table 5:** Motorola's national **SmartNet** trunking system.

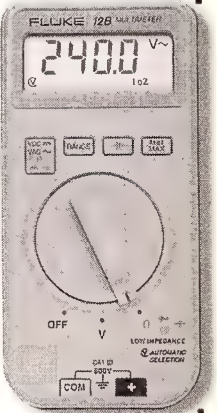
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*Photo: GQ Patrol/Maverick*

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*Photo: 70 Series Landcruiser Troopcarrier-tray back-MWB-SWB-Bundera*

Photo shows longest pod. Two shorter versions also available for the 70 Series.

*Photo: Discovery 1994 and on*

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# Build a short boom 27MHz four-element quad using stainless steel muffler pipe

By Neville Landwehr

Whilst a 4-element full-wave quad is deemed better than most to utilise, boom length, weight and erection can be a little daunting for many to construct. Setting about to overcome all three factors and comply with a request by Council to reduce my mast height by half, I decided to make a quad, placed in a new position in the back yard, and still retain the beam though at half height on the mast.

Living close to the sea, with all the corrosion problems that implies, I decided to try stainless steel for the boom and element wires, with the traditional fibreglass rods as spider arms, then erecting it on my 20 x 30ft shed.

Rather than use a full-length boom, I assessed a 6ft design with the view to achieve a 0.15 wavelength spacing. This meant that the spider arms for each quad had to be canted back from the vertical, thereby creating angles of the horizontal boom. Having a short boom meant it needed to be balanced each side of centre, therefore spider placement was on end, with a 1.5ft spider spacing, then a 3ft spider, and 1.5ft to the end with the other spider.

Checking availability of stainless steel muffler pipe in this part of the world (I live in Geraldton, Western Australia), I found it to be sold in 8ft lengths and in 38mm, 44mm and 50mm OD with wall thickness of 1.5mm. I decided to use the 38mm for the boom and 44mm for the spiders, which would then slip over the boom. This would make it easier to erect and to achieve the correct spacing needs.

Spiders need to be made to the angles required, and to arrive at the correct angle I plotted on graph paper two lines 4ft 6in apart, one of them 6ft long for the boom and one 17ft 6in, being the length of three 5ft 6in spacing for the elements, then marking the positions on the boom to the respective final position on one to depict the correct spacing, thus coming up with the angles needed. In this case they were 49° and 75°. The length of the arms can be done, but allow 6in plus when scaling off, and adjust later when doing the squaring of the quad.

Using a 12-15in length of 44mm stainless steel pipe as the slip pipe, 9in of 9/16in inner diameter pipe is welded to a gusset of stainless plate previously cut to the correct angle. This in turn is welded to the slip pipe, placing each at 90° around the pipe.

The spider arms were made from 13mm fibre rods as used in electric fences. As the spider arms are of different lengths (ie the two inner quads are shorter than the outer two), I found it necessary to join the longer by using the 9/16in pipe. This also allows for length adjustment of the spider arm in forming the required square of the loop, along with adjustment of the 13mm rod in the 9in pipe of the spider. To fix the arm in final positions I used stainless self-tappers to suit, but made a pilot hole in the rods to prevent the fibreglass from splitting.

To prevent corrosion on the elements I used 0.9mm stainless welding wire, it being extra strong. Of course, other wire can be used — it's your choice. Dimensions of the elements are as follows, mine being for 27.355MHz. I guess my age must be showing. As with the above measurements, I worked it all out in feet, but I've converted the vital bits to metric for you as well.

**Reflector** (1030) = 37.653ft (37ft 7-13/16in) ÷ 4 = 9.41ft (9ft 4-15/16in) = 2.865m

**Driven** (1005) = 36.739ft (36ft 83/4in) ÷ 4 = 9.18ft (9ft 2-13/ 16in) = 2.798m

**Directors** (975) = 35.642ft (35ft 7-11/16in) ÷ 4 = 8.091ft (8ft 10-15/16in) = 2.717m

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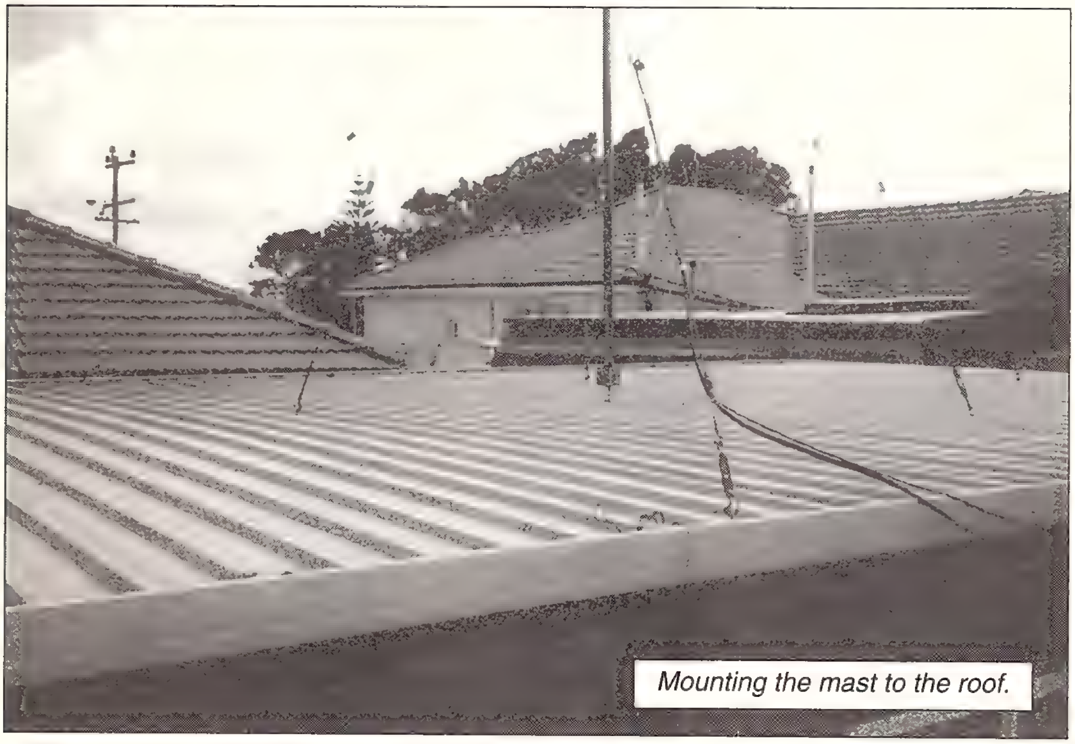
# Build a 27MHz quad antenna...



Mounting the mast to the roof.

To ease placing the wire around the quad, cut each length plus 1ft, then place the spider over a short pipe which has been wedged in a 12 gallon *(that's a bit over 50 litres. Ed.)* bucket of sand facing the spider upwards. Fit each spider arm in position then string the wire through each via a suitable hole drilled 50mm from the end of the rod. Bring the three sides of the quad to the correct length then finally clamp them together at the mid-point using a small pair of multigrips.

To assist in joining the wires at this point I used a 1ft square wooden frame with gutter bolts and aluminium plates to clamp each side, allowing one to tightly twist the wire for 10 turns per side then silver soldered them together using a heavy iron with acid core silver solder and suitable flux to clean the wire. I found 545 flux (available from BOC/CIG outlets) to be good.

To retain the ultimate square formed at the correct 1/4 spacing, I used tie wires made of the same wire, and placed them through the hole, brought the knot back over the rod, and then bound the element wire for 10 turns each side.

To assemble it all together, a temporary pipe mast was placed in the lawn, with the boom fixed to the top, and each spider quad of arms was placed in their approximate final position on the boom. Each slip pipe was wedged in place using 50mm pieces of 38mm pipe placed between the inner and outer pipes. Wedges were formed with a bevel so they could be hammered in or out as needed.

To maintain the respective arms at their correct spacing and to square element to element, I used lengths of 2001b nylon fishing line with loops formed at each end. These spacing lines were made on a board with two pegs spaced at 5ft 6in. Each end loop was clamped around the 13mm peg with sleeve crimps as used by fishermen. Note that the loop needs to be a very tight fit.

Checking that all spaces are correct takes a little time. It is at this point that adjustments are made in positioning the arms in the 9/16in stainless pipe and it creates a sturdy quad of wire. Once all is ship shape, drill a suitable hole through the slip and boom pipes to locate a stainless steel bolt making each spider at the final position. Leave the wedges in position, as these prevent movement of the slip pipe.

The Gamma Match used is that as described in *All About Cubical Quad Antennas* by William I Orr and Stuart D Cowan (mine is the third edition). Having been given a brass two-gang wide-spaced capacitor, cubical in shape with a long tuning shaft, I decided to house this in a good sealing lunch box. I fitted this to the rod suspended from the spider of the reflector which finished mid-point of bottom side of driven element.

The coaxial cable entered the box via a hole and the gamma wire was brought in. The spacing of the gamma wire is a bit touchy. Being of the same material as the element wire, it tends to bend, thus you need to make spacing blocks to keep the wire at the correct distance. So I used two pvc pipe rings cut 5mm wide with a saw cut in the sides to keep the wire in position. The

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length of the gamma is as per that recommended in the table of the above book.

To enhance tuning, on the outer lid of the box I fitted a rubber grommet to bring the shaft in, and made an equal-spaced indicator vernier. This enabled one to know the adjustment as SWR tests were carried out. In addition, I placed silica gel packets (as used in tablet jars) inside the box to compensate for condensation, but I placed a drip hole on bottom of the box in case…

SWR measurements followed, and as the bottom wire was only 8ft above the lawn and the cubical quad itself was mounted between two metal sheds within one wavelength, I expected to have problems. This was not so, and I was able to tune down to 1.3:1 on Channels 20 and 40, and on Channel 1 it came in at 1.05:1 — a very pleasing result indeed.

Whilst waiting for assistance to place the finished antenna on my shed, I carried out further daily SWR tests for a week at varying times of the day with little change at all, even with changing direction of boom. All that remained was a final SWR test when it was in place on the mast above the shed.

The mast I used comprised three lengths of stainless steel muffler pipe cut to size and telescoped within the bottom and middle lengths. This brought the boom to a level of 23ft above shed, and the bottom wire 18ft 6in.

The mast was fitted to the centre of the shed using a builder's stirrup with a bolt through the upright flange and the bottom pipe of the mast, so that it would swivel to be lowered. Eyebolts were placed at 120° to each other and stays fitted via lug plates made of yet more stainless steel plate.

Upper and lower sets of stays were used to maintain the rigidity of the mast, and each stay wire was broken into sections using good insulators, these being obtained from an electrical fencing supplier. Generally, this mast is very similar to that used for TV erection in rural areas.

Erection on the roof was relatively easy, it being awkward but light. Having squared the quads using the nylon line and not relishing undoing the 12 sections, I decided to erect it as a whole unit. It could be assembled by taking up each quad section one by one and bolting them into position, but that would mean undoing the nylon spacing line.

So I lowered the mast to the first section and then fitted the KR400 rotator on the mast plate and placed whole unit on shed roof then into position on rotator clamps.

Thus the mast was raised to height, the stays tightened, and I brought in the 36ft of coax to operator's position and checked the SWR. I could hardly believe that it was even better! How about *nothing* indicated on channel 40 and 20, and just a tiny bit on Channel 1.

Subsequent tests in the past months have not altered the SWR, and the results achieved with the cubical quad are extremely pleasing. Overseas contacts made — though not many — have generally been 5 by 9+. It seems to hold the QSOs a little longer and bring contacts an hour earlier than others in my general location. With tests conducted when propagation was at its lowest ebb, I look forward to the increase when it happens!

So my conclusions are that it's an improvement on my 4-element Yagi by some 3 to 5 S-points, and more directive in contacts made across Australia, with the noise level down in comparison to the Yagi.

A very pleasing result, also it appears to be very stable in terms of high winds not altering the quads about.

Others with a thought to construct a similar antenna may care to vary the boom length, spacing distance and element wire type. You could even try replacing the capacitor with something smaller and still achieve good results overall.

My grateful thanks go to Jim 16 whose welding expertise and assistance enabled me to complete the task and achieve an extremely good result. Apart from the discolouration of the muffler pipe, it does look good, but I need to find suitable paint when next doing maintenance.

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John Batty, VK4MBK, reports on his

# SHORTWAVE LISTENING WITH A DIFFERENCE

## Forget the broadcast stations — here's where to find the really interesting ones...

**John Batty *(caradoc@peg.apc.org)* grew tired of listening to your 'run of the mill' shortwave stations some time ago and now concentrates on some very unscheduled operators. Few would deny that his loggings are somewhat more interesting than the commercial stations...**

Many electrical storms this month (a few even containing a little much-needed rain) have meant that both the computer and the radios have been down more than I like them to be; when you live on top of a ridge composed of sandstone and ironstone it's best not to muck about with the lightning. During the last storm we watched a fifty-foot ironbark blown in half just down the ridge; I shudder to think what it would do to the discone or dipole and anything connected thereto.

The mail and email continue to flow, however. An email note to the WUN mailing list from JC in New Zealand reports ICE-15 and ICE-16 USAF C-141 XD-04 VXE-6 Herc INDIA 2000 Italian Herc with the confusing phonetic 'I' callsign of India.

Auckland guard to 60 South on 5643 and 8867 but also 8998 at times. Mac Centre guard from 60 South on 8998. Also logged were Mac Centre, Mac Weather, Ice Ops, South Pole, all on 8998.

Both JC and Simon (Gold Coast) report seeing confirmations that the New York Air National Guard will take over the Antarctic duty on February 12, introducing the callsign SKIER with the LC-130Hs of 139 Airlift Squadron and losing the XD callsigns. Before then — and, unfortunately, well before you get to read this — we should be hearing KIWI callsigns from the Antarctic as 40 Squadron RNZAF take part in Operation Ice Cube 97/98, which begins on November 17, only a couple of days away as I write this.

From AC near Gin Gin in Queensland comes the logging of ICE-07 and ICE-08 with ICE-16 and 17, along with MAC CENTRE and ICEBERG WEATHER, all on the PacWest Bravo satellite 261.525MHz NFM; AC pulled in the satellite on a Camnis HSC-010 scanner both while mobile and on an old 27MHz CB antenna at home. I needed a preamp on a discone to make the 261.525 signals intelligible. I don't know, maybe this reception thing is all something to do with ley lines.

AC also logged EAGLE 3, LION, TIGER, LEOPARD, JAGUAR and WOLF on 261.85MHz with signals concerning fuel requirements for the MI-17 helicopters, wreck site details etc, and the fact that they shifted frequency to 8822kHz. Welcome back to monitoring after the 35-year break, AC, and hang on to that Camnis, it's a good 'un.

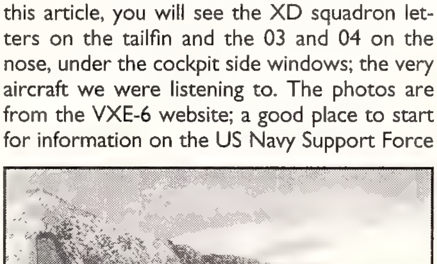
Concerning the group on 261.85MHz (the Joint Task Force — Full Accounting or JTF-FA), Simon from the Gold Coast pointed me in the right direction with his email recommendation that I visit **http://grunt.space.swri.edu/jun94_16.htm** on the Web. If you are interested in the job these people are doing and have 'net access I can assure you of some fascinating reading as you track through the site.

I have had one or two e-mails letting me know that the 261.85 JTF-FA signals have been around for the last four years; I also get e-mails from people who have just plugged in their first scanner and found the frequency active, so loggings of them are still fair game and can be very interesting, as when Cambodia recently suddenly became a bad place to be.

Sir Steve in Cairns is listening to the Puckered Penguins in Antarctica; he heard ICE-11 inbound to McMurdo and another aircraft on the ice with flight control problems.

So far in my restricted listening periods I've followed ICE 05, 07 (which had an APU problem on engine start at McMurdo), 08, 10, 12, 13, 17, 18, 20, 21, 22 and 23 (which had queries about crew rest time and the whereabouts of his specially-ordered T-shirt), along with XD-03 and XD-04. ICE callsigns seem to be consecutively numbered rather than tail number suffixes; XD callsigns (the VXE-6 Hercs) are sticking to -03 and -04 suffixes, indicating the same aircraft each time that callsign flies. ICE-21, ICE-22, XD-03 and XD-04 all flew the same day, many days after JC's logging of XD-04 and ICE-15 and 16.

If there is room for the Production Editor to include both photos of LC-130 Hercs with this article, you will see the XD squadron letters on the tailfin and the 03 and 04 on the nose, under the cockpit side windows; the very aircraft we were listening to. The photos are from the VXE-6 website; a good place to start for information on the US Navy Support Force in Antarctica, with a link to the squadron, is **http://www.asa.org/ndfr/ index.htm**. MAC CENTRE gave their new HF frequency to ICE-21 as 23,518kHz.



Simon on the Gold Coast also let me know that he has discovered that the numbers station operating on 8989kHz from 0800z on Wednesdays is called by ENIGMA 'The Spanish Lady' with an ENIGMA ID of V2. It apparently transmits to Cuba and other parts of South America from the US. Also while sleuthing on the 'net, Simon discovered the identities of callsigns ARCTIC WARRIOR, TOP COVER and TOP ROCC, which we previously thought was TOP ROCK, on 281.8MHz.

Simon says "...in the history section of the USAF '11th Air Force 50th Anniversary Home Page' at **http://www.topcover.af.mil/orgs/11af/index.htm**, 11th Air Force refers to itself as the ARCTIC WARRIOR(s) and its motto is 'TOP COVER and Global Power'...".

TOP ROCC is the Regional Operational Control Centre/Joint Surveillance System in Alaska which, since 1983, has co-ordinated communications from military aircraft and ground stations and real-time information from 13 remotely-located unmanned radar sites in northern Alaska and Canada. I logged it at 0918z on 261.8MHz doing a "...SatCom check in the plain...".

### HF loggings for the month

**17,499kHz**

USB at 2300z; 'Cherry Ripe' numbers station daily at S8 with preface 550115 repeated 10 times (I only heard three) followed by two tones, then into five-number groups each repeated twice. End of groups indicated by two tones, then into 'Cherry Ripe' tune (which would also have been played three times before the preface). Cherry Ripe beams its signal towards mainland Asia, is under the control of the British Foreign and Commonwealth Office and operates from Guam using US facilities.

**11,175kHz**:

TOTEM 1658 calling mainsail and then Hickam at 0814z, both unanswered; heard again at 1100z calling Yokota — again not heard. Quiet trip; a C-130H of 517AS, 3W, Elmendorf AFB Alaska (PACAF).

At 1111z, HS-440 called Yokota with no luck then called Mainsail. At 1113z, SAM 206 called Mainsail then called HS-440 for a signal check. SAM-206 is one of the Special Air Mission aircraft for which I don't have a tail number — I would hazard a guess that it would be one of the series of C-20B Gulfstream III aircraft owned by 89AW Andrews AFB, tail number probably 86-0206. SAM-201 and SAM-202 also heard this month, both at 1201z with McDill on this frequency, and they are definitely Gulfstreams, tail numbers 86-0201 and 86-0202. HS-440 is unknown but had modem traffic for relay through Andersen to callsign SKYVIEW.

SAM 375 with a ground station advising that "Andrews VIP advise they are having comms difficulty at the moment, give them a call later on 311 upper". Like an idiot I went off looking in the lists for Zulu 311, and wasted time not finding it because there isn't one, it only dawning on me later that for a SAM I should have looked up MYSTIC STAR 311, which is 11,220kHz.

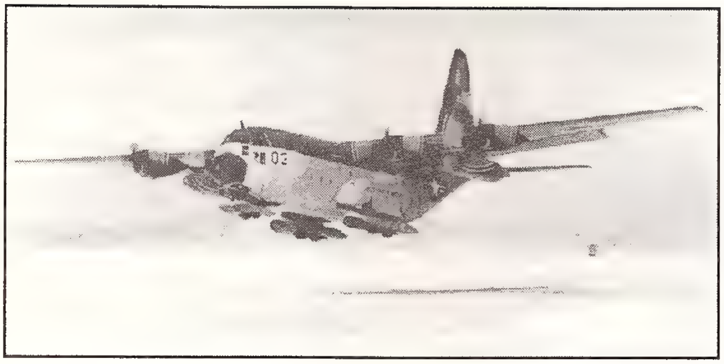
EVAC 280 at 1153z inbound to Hickam, ETA 1430z, 39 pax, two litter patients, three ambulatory, two attendants and four med crew.

S4JG doing a radio check also at 1153z; this station normally on 8971kHz and is the US Navy Atlantic TACAMO aircraft.

SPAR 99 receiving weather via Thule at 1145z for UTAA, "...ETA 1305z and UBBB, Baku, Azerbaijan, ETA 1335z. Please call the Embassy and arrange diplomatic details...". This is a USAF Europe aircraft belonging to 75AS/86AW, Ramstein AB Germany, probably a C-20B Gulfstream.

SAM 86971 calling Mainsail with a request at 2346z; not heard.

RUBY or ROOFY-91 (neither callsign known) at 0020z with modem traffic to Yokota after QSY to 15,016kHz.



**8968kHz**:

EPIC 51 heard at 0541z calling Andersen; epic indeed for a C-130 of 156AS, North Carolina Air National Guard at Charlotte.

REACH 118 called in a position report from 14°N 156°W at 0822z, destination KSUU Travis AFB. Travis Meteo answered as "WEATHER APPRENTICE".

SHUCK 77 put through a PP via Lajes (Azores) to RAYMOND 24, which is Tinker AFB, take-off time 0706z ETA 1245z. An E-3C Sentry of 552ACW at Tinker. "ET phone home...".

REACH 5E2, a self-identified C-130 tail number 65028 (perhaps a kind tail-number collector will let us know which squadron this belongs to?) called Hickam at 1012z with an ETA of 1330z. He was inbound, loaded to the gills, position 1°N 166°W at FL370 (37,000 feet). The call went through Andersen so it's odds on he was east-bound from the greater Pacific area.

An aircraft with the callsign suffix -496 called Lajes at 0857z asking for the NIGHTWATCH frequency and was given Z211; this is 12,070kHz, but when I immediately dialled it up I found Swiss Radio International on the frequency at +10dB, with traditional/jazz music followed by an English ID and the news in Italian at 0900z. (Oh well. May as well make the most of it — its QSL address is SRI, 3000 Berne 15, Switzerland!)

US Navy aircraft TN-848 called its Duty Office (which identified as CHASER) at 0943z to report "...no joy on HF or S1, aft 'gadget' (radar) bent due to loss of waveguide pressure, front 'gadget' broken due to loss of stabilisation; unable to paint in front of the aircraft...". The DSN telephone number given appears to be at the Naval Air Facility, Misawa AB, Japan.

PACOM 01 with an initial call this frequency and taken to 11,244kHz by Andersen for a PP to Hickam; departed 0950z ETA 1310z, Alpha 2 for Flight Control Pulleys, 19 crew, three pax names/ranks given.

REPAT 98 calling Mainsail and Hickam from 1123z.

Out of space again — keep that mail coming, and we'll see you again next month.

Enjoy your holidays!

## The Raymond channels...

RAYMOND callsigns have been mentioned a couple of times recently. There are a whole swag of consecutively-numbered RAYMOND stations which may be requested as a phone patch. They are:

RAYMOND, USAF general call for any Air Combat Command Command Post
RAYMOND 1, Langley AFB Virginia, HQ Air Combat Command
RAYMOND 3, Langley AFB Virginia, HQ Air Combat Command
RAYMOND 6, George AFB California, 35TTW/37TFW CP
RAYMOND 7, Cannon AFB New Mexico, 27/35TFW CP
RAYMOND 8, Davis-Monthan AFB Arizona, 42ECS CP
RAYMOND 9, Howard AFB Panama Air Combat Command CP/Dyess AFB ACC CP (Howard AFB Panama is closing or has already closed).
RAYMOND 10, Hurlburt Field AFB Florida, 1SOW CP/Tyndall AFB Florida, 325TTW CP/Little Rock Arkansas AFB CP (Home town of Slick... sorry, President Clinton).
RAYMOND 11, Eglin AFB Florida, 33TFW CP
RAYMOND 12, England AFB Louisiana, 23TFW CP
RAYMOND 13, Homestead AFB Florida, 482TFW CP/Beale AFB California CP
RAYMOND 14, Holloman AFB New Mexico, 49TFW CP
RAYMOND 15, Homestead AFB Florida, 31TFW/27TFW CP
RAYMOND 16, Langley AFB Virginia, 1TFW CP
RAYMOND 17, Moody AFB Georgia, 347TFW CP
RAYMOND 18, Luke AFB Arizona, 405TTW CP
RAYMOND 19, McDill AFB Florida, 56TTW CP/Robins AFB Georgia CP
RAYMOND 20, Patrick AFB Florida, 549TASG CP
RAYMOND 21, Myrtle Beach AFB South Carolina, 345TFW CP
RAYMOND 22, Nellis AFB Nevada, 474TFW/57FWW CP
RAYMOND 23, Hill AFB Utah, 388TFW CP
RAYMOND 24, Tinker AFB Oklahoma, 507W/552AWACS CP
RAYMOND 25, Seymour-Johnson AFB North Carolina, 4TFW CP
RAYMOND 26, Shaw AFB South Carolina, 363TFW CP
RAYMOND 27, Mountain Home AFB Idaho, 662ACW/366TFW CP
RAYMOND 28, Bergstrom AFB Texas, 67TRW CP
RAYMOND 35, Wyoming National Guard
RAYMOND 37, Exists but identity unknown at writing
RAYMOND 39, Whiteman AFB Missouri, CPRAYMOND 40, McConnell AFB Kansas, CP
RAYMOND 104, Tyndall AFB Florida, 325FW CP

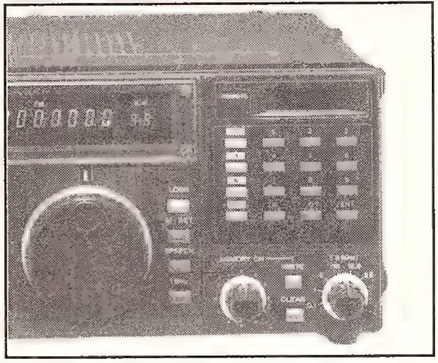
Two or three of these either have multiple identities or have been identified as different stations by different monitors. Most times RAYMOND stations will identify over the air as only 'CP' or 'Duty Office' and not mention the base name, but if the call involves a switch to the weather office for a forecast then the base location will be mentioned.

## Channel numbers' frequencies

This is the latest update I can find to the NIGHTWATCH Zulu Channel Designators list:

| Number | kHz |
|---|---|
| Z100 | 3068 |
| Z105 | 3116 |
| Z110 | 3134 |
| Z115 | 3143 |
| Z120 | 3295 |
| Z124 | ? |
| Z125 | 4495 |
| Z130 | 4472 |
| Z135 | 4745 |
| Z140 | 5026 |
| Z145 | 5705 |
| Z150 | 5800 |
| Z155 | 5875 |
| Z160 | 6715 |
| Z165 | 6757 |
| Z170 | 7831 |
| Z174 | ? |
| Z175 | 9016 |
| Z180 | 9057 |
| Z185 | 9809 |
| Z190 | 10,204 |
| Z195 | 11,104 |
| Z200 | 11,181 |
| Z205 | 11,494 |
| Z210 | 11,229 |
| Z211 | 12,070 |
| Z215 | 13,242 |
| Z220 | 13,245 |
| Z225 | 13,907 |
| Z230 | 15,046 |
| Z235 | ? |
| Z240 | 15,097 |
| Z250 | 15,962 |
| Z270 | 18,027 |
| Z275 | ? |
| Z315 | 23,872 |
| Z330 | ? |

# SHORTWAVE LISTENING



All times are expressed in Coordinated Universal Time (UTC or 'z'). Add 10 hours for Eastern Standard Time, 9.5 hours for Central Standard Time, eight hours for Western Standard Time and 12 hours for New Zealand Standard Time. Readers in areas where Daylight Savings Time is observed should add one further hour.

## North Korea

Schedules for the **Korean Central Broadcasting Station** (**KCBS**) and **Peoples Broadcasting Station** (**PBS**) are very hard (if not impossible) to obtain through official channels. North Korea watcher Sonny Ashimori offers these observations (via *Hard-Core DX*), as monitored in Japan:

**Korean Central Broadcasting Station:**

2850 kHz: Pyongyang 2000-1800z
3220 kHz[1]: Hamhung 2000-1800z
3350 kHz: Pyongsong 2000-1800z
3920 kHz: Hyesan 2000-1800z
3945 kHz[2]: Unknown 2000-1800z
3960 kHz: Kanggye 2000-1800z
3970 kHz[1]: Wonsan 2000-1800z
6100 kHz: Pyongyang 2000-0630 and 1500-1800z
9665 kHz: Pyongyang 2000-0930z
11,680 kHz: Pyongyang 2000-1800z

Notes: [1] 3220 kHz Hamhung and 3970 kHz Wonsan relay PBS 1800-2000z.
[2] New frequency, possibly Chongjin (replacing 3980 kHz).

The earlier 2350 kHz Sariwon service has been absent since early this year.

**Pyongyang Broadcasting Station**

3220 kHz: 1800-2000z (relay via KCBS Hamhung)
3250 kHz[3]: 2100-2200z, 0200-0630z, 1500-2030z
3320 kHz: 2100-1900z
3970 kHz: 1800-2000z (relay via KCBS Wonsan)
6250 kHz: 2100-1900z
6400 kHz: 2100-1800z (measured at 6398 kHz from mid-November)

[3] 3250 kHz relays **Radio Pyongyang** in Japanese 2300-0100, 0700-1000, 1100-1400z. Some times for this frequency are presumed, as propagation not possible during local daylight hours.

KCBS is the service for domestic listeners, whilst PBS is intended for an audience in South Korea.

## One day a transmitter site, the next...

According to an Associated Press report, the US General Services Administration has recommended that the former **Voice of America** relay station at Bethany, Ohio, 20 miles north of Cincinnati, is be turned into a golf course.

The 600 acre site was closed in 1994, when the VOA was consolidated with other international services, such as **Radio Marti** and **Radio Free Europe**. Besides the golf course, the report recommends the site also be used as a high-tech learning centre by area universities. When it opened in 1944, the VOA station had 24 shortwave antennas and six 200 kW transmitters.

## Moldova

And this schedule for **Radio Moldova International**, from Marc Vissers...

## 50 years of English from CRI

*A meeting of several broadcasting veterans recently marked the 50th anniversary of* ***China Radio International****'s English service, which traces its roots to a humble transmitter that commenced broadcasting from Shaanxi Province in north-west China in 1947.*

*Allocated with the call letters* ***XNCR****, the station carried programs made in a twenty square metre studio cut out of the Taihang Mountains, approximately 400 km south-west of Beijing. At that time the English service mainly served foreign journalists based in areas controlled by the nationalist Kuomintang, but the scope and outreach of the station expanded when the Peoples' Liberation Army marched into the capital in 1949. XNCR was renamed* ***Radio Peking*** *at the same time.*

*Despite meagre news-gathering resources and modest equipment, the English service's programming soon expanded from half an hour to one hour, and broadcasting time to eighteen hours per day, beaming to such target areas as South-east Asia, Europe, North America and North Africa.*

*The current Beijing authorities are quick to describe Mao's Cultural Revolution as 'ten chaotic years', when news or a single commentary would sometimes stretch for the full length of the broadcast. Common sense is said to have prevailed from 1983, when cultural programming began to once again complement the news content, coinciding with a change of name to* ***Radio Beijing****. Around the same time, the English department began producing special programs on FM and medium wave to service the growing tourist trade and other foreigners living or travelling in China.*

*On New Year's Day 1993, Radio Beijing was transformed into China Radio International, and by this time the station had also began to make use of relay facilities in countries such as France, Switzerland, Spain, Mali, French Guiana, Canada, Brazil and Russia. A new office building was opened in 1997, including digital studios, phone-in facilities for journalists and computer support.*

*New, more modern transmitters are also believed to have been pressed into service in the middle of 1997. Possible future plans are said to include an Internet radio service and further local re-broadcast agreements with foreign medium wave stations.*

*English services from China Radio International are currently listed to:*

***North America***
*0300-0400z: 9690 kHz*
*0400-0500z: 9730, 9560 kHz*
*0500-0600z: 9560 kHz*
*1400-1600z: 7405 kHz*
***Europe***
*2000-2100z : 6950, 9920 kHz*
*2100-2200z: 6950, 9920 kHz*
*2200-2230z: 3985 kHz*
*2200-2300z: 7170 kHz*
***South-east Asia***
*1200-1300z: 1341, 9715, 11,660 kHz*
*1300-1400z: 1341, 11,660 kHz*
***South Asia***
*1400-1500z: 11,825, 9535 kHz*
*1500-1600z: 7160, 9785 kHz*
***South Pacific***
*0900-1000z: 9785, 11,755 kHz*
*1000-1100z: 9785, 11,755 kHz*
*1200-1300z: 6950, 7385 kHz*
*1300-1400z: 7385 kHz*
***East and South Africa***
*1600-1700z: 9565, 9620 kHz*
*1700-1800z: 7150, 9570, 7405 kHz*
*2000-2100z: 7170, 7160 kHz*
*2100-2130z: 7170, 9535, 7180 kHz*
***West and North Africa***
*1900-2000z: 6955, 9440 kHz*
*2000-2100z: 7175, 9440 kHz*
*2100-2130z: 7170 kHz*

*CRI now publicises an E-mail address:*
***crieng@public.bta.net.cn***

0230-0255z Spanish 9400 kHz to Latin America
0300-0330z Romanian 7500 kHz to the USA and Canada
0330-0355z English 7500 kHz to the USA and Canada
0400-0425z Russian 6135 kHz to Russia
0430-0455z English 7500 kHz to the USA and Canada
1200-1225z Spanish 15,315 kHz to Mexico
1230-1300z Romanian 9400 kHz to the USA and Canada
1930-1955z Russian 7500 kHz to Russia
2000-2025z French 7520 kHz to Europe
2030-2055z Spanish 7520 kHz to Europe
2100-2125z French 7520 kHz to Europe
2130-2155z Spanish 7520 kHz to Europe
2200-2225z English 7520 kHz to Europe
2300-2325z English 7520 kHz to Europe

Radio Moldova International uses transmitting facilities in Galbeni, Romania.

## Thailand

*Here is the 'W97' schedule for **Radio Thailand**'s broadcasts from the Voice of America's facility at Udorn Thani:*

| *Time* | *Language* | *Target* | *Frequency* |
|---|---|---|---|
| *0000-0030z* | *English* | *Africa* | *9680 kHz* |
| *0030-0100z* | *English* | *Eastern North America* | *11,905 kHz* |
| *0100-0200z* | *Thai* | *Eastern North America* | *11,905 kHz* |
| *0300 0330z* | *English* | *Western North America* | *11,890 kHz* |
| *0330-0430z* | *Thai* | *Western North America* | *11,890 kHz* |
| *0530-0600z* | *English* | *Europe* | *15,115 kHz* |
| *1100-1115z* | *Vietnamese* | *Asia* | *7285 kHz* |
| *1115-1130z* | *Khmer* | *Asia* | *7285 kHz* |
| *1130-1145z* | *Lao* | *Asia* | *6040 kHz* |
| *1145-1200z* | *Burmese* | *Asia* | *6040 kHz* |
| *1200-1215z* | *Malay* | *Asia* | *11,805 kHz* |
| *1215-1230z* | *Indonesian* | *Asia* | *11,805 kHz* |
| *1230-1300z* | *English* | *Asia* | *9810 kHz* |
| *1300-1315z* | *Japanese* | *Asia* | *7145 kHz* |
| *1315-1330z* | *Mandarin* | *Asia* | *7145 kHz* |
| *1330-1400z* | *Thai* | *Asia* | *7145 kHz* |
| *1400-1430z* | *English* | *Asia* | *9530 kHz* |
| *1800-1900z* | *Thai* | *Middle East* | *11,855 kHz* |
| *1900-2000z* | *English* | *Europe* | *9535 kHz* |
| *2000-2015z* | *German* | *Europe* | *9535 kHz* |
| *2015-2030z* | *French* | *Europe* | *9535 kHz* |
| *2030-2045z* | *English* | *Europe* | *9535 kHz* |
| *2045-2115z* | *Thai* | *Europe* | *9535 kHz* |

### Darwin proposal rejected

Since our last issue, shortwave broadcasting even made it into our domestic headlines due to a formal request from US diplomats to the Australian government for leased air time on the now mothballed Cox Peninsula transmitters, near Darwin.

Faced with a limited number of available relay sites in the region, the US 'surrogate' broadcaster **Radio Free Asia** sought to purchase airtime via the former **Radio Australia** facility for coverage of China and south-east Asia on a three month 'trial' arrangement.

RFA broadcasts contain news and information for listeners in such countries as China, Laos, Vietnam and Burma —news which may not always be available from the domestic media in those locations. The target governments find this to be unwelcome and intrusive US propaganda, and have been known to place diplomatic pressure on neighbouring states that have been considered as relay bases for the transmissions. Thailand and the Philippines, for example, were unwilling for RFA broadcasts to go out via US-owned transmitters sited within their borders.

Happily, the Australian Department of Foreign Affairs has also found the issue to be too much of a political hot potato, and is no doubt keen to avoid antagonising China over the issue. Successive governments have long been reticent to rent out Radio Australia facilities to overseas stations, however since several have expressed interest in the recommissioning of the Darwin facility, one wonders how long the temptation to accept such offshore revenue will be resisted.

## Change afoot at WRTH...

*The Editor in Chief of the World Radio TV Handbook, Andy Sennitt, and Managing Editor Bart Kuperus have both announced their imminent departure from that esteemed publication. Sennitt became Assistant Editor of the DXer's 'Bible' in 1978, after a stint with the BBC Monitoring Service, ascending to Chief Editorship in 1987 on the retirement of Jens Frost. He will now become a media consultant, after 20 years at the WRTVH editorial office in Denmark. Kuperus will in future be working in the computer field.*

*With publication of the 1998 edition of the Handbook due any day now, one wonders at the long term prospects for the publication. Certainly it will be difficult for parent company Billboard Publications to fill its two key positions simultaneously.*

### News in brief

- In WWDXC's *Top News*, Noel Green of the UK gives this schedule for **Radio Romania**'s obscure service for offshore fishermen and other mariners:

0800-0856z: 15,335, 15,370, 15,380, 17,745, 17,790 kHz
0900-0956z: 15,380, 17,745 17,790, 21,480, 21,590 kHz
1000-1056z: 15,250, 15,335, 15,380, 17,745, 17,790 kHz

- From *World of Radio* the news that the 500kW shortwave station in Maine previously known as **WCSN** and, more recently, **WVHA**, has finally been sold. The purchaser is LeSea Broadcasting, owner of **WHRI** and **KWHR**. The sale price was only US$1.5 million, and there are fears that this may drive down the value of other shortwave operations on the market, such as **WRMI** in Miami. The Maine transmitter was scheduled to come on stream from late December.

- Here is the latest schedule for **Radio for Peace International** in Costa Rica:

6980 kHz (USB) 0000-1200 (10 kW)
7385 kHz (AM) 2200-1700 (30 kW)
15,050 kHz (AM) 1700-0000 (10 kW)
21,465 kHz (USB) 1200-0000 (3 kW)

Note the reintroduction of 21,465 kHz, which should be possible (local) early mornings in these parts.

- The **Voice of Greece**'s relayed transmission at 1200z via facilities on US soil has moved frequency to avoid a conflict with **Radio Australia** on 9580 kHz. The new channel is 9690 kHz and this move also allows secondary coverage of RA's signal for the Americas.

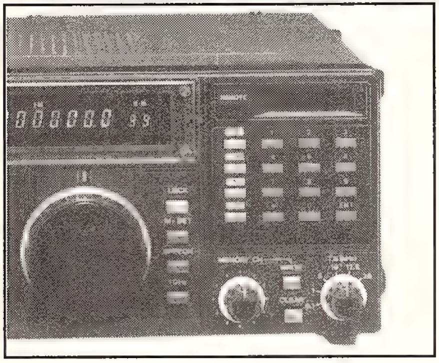
### Klingenfuss guides

Klingenfuss Publications has announced five new products that came on the market during December:

- 1998 Shortwave Frequency Guide;
- 1998 Super Frequency List on CD-ROM;
- 1998 Guide to Utility Radio Stations;
- Digital Data Decoder Screen shots;
- 1998 ARRL Handbook on CD-ROM.

The new 1998 Shortwave Frequency Guide was, again, published and distributed only a few days after the final 1998 broadcast schedules were put in place. As a result of reader feedback, there is now an

... ☞



alphabetical list of broadcast stations. The guide now runs to an impressive 600 pages.

The 1998 Super Frequency List on CD-ROM is now in its fourth edition and features software interfaces to leading receiver control programs, plus digital data decoder shareware. This latest edition now comprises approximately 38,000 entries with all clandestine, domestic and international broadcast stations worldwide, plus all utility and formerly active radio stations as well.

The 1998 Guide to Utility Radio Stations (16th edition) is the international standard reference book for professional radio monitoring services and shortwave listeners alike. It now includes dozens of sample screen shots of digital data transmissions and state-of-the-art equipment as well. A more comprehensive compilation of is now available separately on diskette. These are in a number of standard graphic formats. It demonstrates analysis, classification and decoding.

Of more general interest, the 1998 ARRL Handbook on CD-ROM is now also available from Klingenfuss, although it is also available in Australia from such outlets as Daycom.

You can get further information from the Klingenfuss website: **ourworld.compuserve.com/homepages/Klingenfuss/**, E-mail klingenfuss@compuserve.com, or write direct to:

Klingenfuss Publications,
Hagenlöher Straße 14,
D-72070 Tübingen,
Germany

## Liberian activity

In *DX Window* Fin Krone of Denmark reports on a new station using 3450 kHz and identifying as **Radio Veritas**, Monrovia. Reception was from 0515 to past 0550z with local language talk and songs, interspersed with English identification announcements like "...Listen to Radio Veritas — we are the Voice of Truth..." and "...Radio Veritas — your friendly station...".

## Scandinavia in English

**Radio Sweden** publicises this schedule for English broadcasts on shortwave:

**Europe and Africa/Middle East:**
1830z: 1179, 6065 and 9645 kHz (Sundays 9645 kHz only)
2030z: 1179 and 6065 kHz
2130z: 1179, 6065 and 9655 kHz (weekends only)
2230z: 1179, 6065 and 7325 kHz
**Asia/Pacific:**
1330z: 9705 and 13,740 kHz
1430z: 11,880 kHz
0130z: 7265 kHz
**North America:**
1230z: 11,650 (or 13,740) and 15,240 kHz
1430z: 11,650 and 15,240 kHz
0230z: 7280 kHz
0330z: 7115 kHz

Each program Monday to Friday, recorded at 1330z, is available in RealAudio format at: **http://www. sr.se/rs/english/sounds/ english.ramNorway**

**Radio Norway International** continues to maintain an extensive schedule on shortwave. Here are some of the more conveniently timed (and directed) transmissions for the 'W97' transmission period:

| Time | Prog | Freq | Az° | Target |
|---|---|---|---|---|
| 0000z | 2 | 7560 | 80 | South-East Asia, West Australia |
| | 2 | 7465 | 280 | Eastern North America |
| 0600z | 2 | 7180 | 180 | Europe, West Africa, New Zealand |
| | 1 | 5965 | 180 | Europe North |
| | 2 | 13,800 | 165 | Africa, South and East |
| | 2 | 9590 | 220 | Europe, Africa West, New Zealand |
| 0700z | 1 | 7180 | 195 | Europe, New Zealand |
| | 1X | 11,625 | 180 | Europe, West Africa |
| | 1X | 9590 | 165 | Europe, New Zealand |
| 0800z | 1X | 11,625 | 220 | Southern Australia |
| | 1 | 15,175 | 95 | Middle East, South Asia |
| 0900z | 2 | 11,625 | 220 | Southern Australia |
| | 1 | 13,800 | 35 | Far East |
| 1200z | 1 | 13,800 | 180 | Europe |
| | 1 | 11,840 | 280 | Eastern North America |
| | 1 | 15,605 | 80 | South-East Asia, north-eastern Europe, Western Aust |
| | 1 | 9905 | 35 | Far East |
| 1300z | 2X | 9590 | 180 | Europe |
| | 2X | 13,800 | 80 | South-East Asia, eastern Europe, Western Australia |
| | 2X | 9905 | 35 | Far East |
| | 2X | 13,805 | 300 | North and Central America |
| 1900z | 1X | 9960 | 315 | western North America |
| | 1X | 9590 | 180 | Africa, New Zealand |
| | 1X | 7485 | 145 | Europe |
| | 1X | 1314 | ND | Europe |
| 2000 | 1 | 7540 | 195 | Europe, Africa |
| | 2X | 7570 | 65 | Australia |
| | 1 | 9960 | 315 | western North America |
| 2100z | 1 | 7570 | 65 | Australia |
| 2200 | 1 | 7405 | 35 | Far East |
| | 1X | 7570 | 235 | South America |
| 2300z | 1 | 7560 | 80 | South East Asia, Western Australia |
| | 2 | 7570 | 235 | South America |
| | 1 | 7465 | 300 | North and Central America |
| | 2 | 7405 | 035 | Far East |

Monday to Sunday: Programs marked with a '1' and '2' are broadcast in Norwegian.
Sundays only: Programs marked with a 'X' are broadcast in English only.

This news received direct from *Radio Norway International*. Note that programs are 30 minutes in duration, and are followed by broadcasts from *Radio Denmark*.

## The Philippines

Another **Radio Veritas** is operated by the Catholic Church in the Philippines, and broadcasts to Asia according to this schedule (major languages listed only):

| | | | | |
|---|---|---|---|---|
| **Bengali** | 0100-0125z | 15,335 kHz | 250 | 300 |
| | 1400-1425z | 9680 kHz | 250 | 300 |
| **Hindi** | 0130-0155z | 15,335 kHz | 250 | 300 |
| | 1330-1355z | 9680 kHz | 250 | 300 |
| **Indonesian** | 2300-2325z | 11,820 kHz | 250 | 222 |
| | 2300-2325z | 9505 kHz | 250 | 222 |
| | 1200-1225z | 9505 kHz | 250 | 222 |
| **Mandarin** | 2100-2255z | 6190 kHz | 250 | 355 |
| | 1000-1155z | 9520 kHz | 250 | 331 |
| **Burmese** | 2330-2355z | 9535 kHz | 250 | 280 |
| | 1130-1155z | 9670 KHz | 250 | 280 |
| **Filipino** | 2230-2255z | 6075 kHz | 250 | 355 |
| **Filipino** | 1500-1525z | 9680 kHz | 250 | 300 |
| **Filipino** | 1525-1555z | 9680 kHz | 250 | 300 |
| **Russian** | 0230-0325z | 11,805 kHz | 250 | 015 |
| | 1430-1525z | 9660 kHz | 250 | 330 |
| **Sinhala** | 0000-0025z | 9670 kHz | 250 | 280 |
| | 1330-1355z | 9660 kHz | 250 | 280 |
| **Tamil** | 0030-0055z | 9670 kHz | 250 | 270 |
| | 1400-1425z | 9520 kHz | 250 | 270 |
| **Telugu** | 0100-0125z | 15,530 kHz | 250 | 280 |
| | 1430-1455z | 9520 kHz | 250 | 280 |
| **Urdu** | 0200-0225z | 15,335 kHz | 250 | 300 |
| | 1530-1555z | 9670 kHz | 250 | 300 |
| **Vietnamese** | 2330-2355z | 9670 kHz | 250 | 280 |
| | 0130-0225z | 15,530 kHz | 250 | 280 |
| | 1030-1125z | 11,850 kHz | 250 | 280 |
| | 1300-1325z | 7265 kHz | 250 | 280 |

This one is listed in the World Radio TV Handbook as **ELCM**, and had previously operated on the FM band only. The evening close appears to be around 2200z daily, but prior to that it's worth looking for the other currently-active Liberian stations, **Star Radio** 3400 kHz and **Radio Liberia** 5100 kHz.

Radio Veritas is operated by the Catholic Media Centre in Monrovia, and its distinctive format includes morning mass at 0600z.

Some further news, passed on by Colin Miller via *rec.radio.shortwave*: According to two key Sudan Interior Mission (SIM) missionaries featured on Moody Broadcasting Network's *Prime Time America*, Gospel station ELWA will soon be on the air again from Monrovia.

Initially, SIM is planning to install a new 275 Watt FM transmitter, slated for the near future. The political situation in Liberia is relatively stable again, hence the organisation's decision to go ahead with the project. There is a damaged 10 kW SW transmitter which needs to be worked on, and an antenna to be erected, however no target date for the return to shortwave has been announced.

And we have a report sourced to David Butty in the *Detroit News* via Mike Cooper in *Review of International Broadcasting* on the status of the Voice of America's former transmitter site near Monrovia. Apparently the antennas still stand, but the grounds are now home to 27,000 people displaced by the civil war. Tiny huts are open to cold winds from the nearby Atlantic and flooding at high tide. People sleep on the bare ground and commonly die of pneumonia. A former resident called the abandoned VOA site "...a death trap, a hell on earth...".

Have a good break, and see you again next time!

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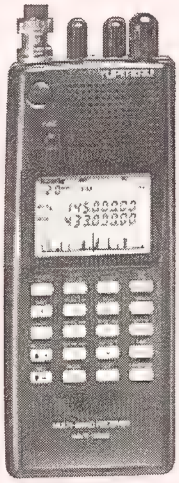

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# Gone Tropo

*from Chris Davis, VK1DO*

Of all the traditions associated with amateur radio, the QSL card is perhaps the most quaint. The QSL card is the pride and joy of one operator, the bane of another person's existence and quite irrelevant to others. Unfortunately, to ignore the role of the confirmation card is to disregard one of the oldest foundation traditions and be left with some people believing that your heart is not quite in it.

In this era of electronic mail, overseas telephone calls a day-to-day occurrence, indeed taking place between callers each in their motor cars or luxuriating on the beach, the concept of a piece of cardboard, sent through the world's mail system or through the various amateur bureaus, must seem so anachronistic, so pedestrian juxtaposed with our cut and thrust, technocratic world. Sadly, once you examine the role of the beloved or dreaded QSL card too carefully, you will start to bring not just that issue into question but so many other aspects of our hobby that are similarly peculiar and equally pivotal within our hobby but are, clearly, very dated.

The earliest role of the QSL card was simply to promulgate a written confirmation that a radio contact had taken place, indicating in writing what had been decoded from the Morse received and so on. To claim something as unbelievable as having communicated without wires, across some distance, was quite an outlandish notion, likely to be interpreted as a trick or a hoax.

To a casual observer and commercial customer alike, the proof of communication, arriving through the trusted mail system was instrumental to the initial acceptance of radio's purported potential.

> ***"... your radio waves had made the trip and the QSL card was confirming the majesty of your accomplishment ..."***

Building on the symbolism of the post card, sent by world travellers to invigorate their colleagues left in the colder climate at home, the QSL card acted to mirror the fact that, although you hadn't visited a distant place in person, your radio waves had made the trip and the author of the card was confirming the majesty of your accomplishment.

Thus was borne a tradition which had significant purpose originally, but in many ways has become a sideline to a larger hobby, adding a human element to an otherwise anonymous activity and, most effectively, prior to picture transmission modes, allowing operators to exhibit themselves, their station or their local region.

Some of our Asian cousins appear to have partners in marriage of such bountiful and beauteous demeanour that they feel compelled to include candid shots of them wearing nothing more than their birthday suits. If you haven't received such an art work, perhaps you will regain an enthusiasm for 21MHz, and soon.

Another angle, which has some delightful hyperbole, is the practice of photographing a local radio landmark, like a large parabolic dish or broadcast station antenna suggesting that the massive antenna farm or radio spectacle is part of your home station. Conversely, some photographs that are included of so called amateur stations, actually look like commercial stations.

Regardless of how elaborate or how simple your card is, the importance of it in exchanges with DX or within rare contacts, remains vital. Unfortunately, the process by which an operator starts their life in the hobby, compared with a more venerable and veteran operator, these

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## Gone Tropo

*from Chris Davis, VK1DO*

days leads to widely-ranging attitudes to the role of a QSL card. Some operators will send a card for a cross-town contact and virtually every other time they talk to a new station, whereas other operators print no more than a few cards every five years, reserving their promulgation for rare and unusual situations.

Unfortunately, while every operator is entitled to their own opinion and independent course of action, some of the indifference in attitude toward QSL cards manifests itself, eventually, as plain rudeness.

If you don't believe in QSL cards, full stop, it need not stop you from receiving a card, writing confirmed and signing it with your name and callsign and sending it back, either directly or more frugally through the bureau.

The issue is one which begs the question of whether we ought to be published in the call book as does not QSL or will QSL.

Perhaps some people deserve to be listed as *might* QSL which, we would all have to agree, is most unfair. Somehow, issues like these are fraught with the vagaries of personality and are thus quite nebulous.

The capacity to shame people into compliance is virtually nil and understandably so. The cost of postage, cards etc is negligible but seems to worry the hell out of some fellows, perhaps retired and watching their pennies.

Frankly, although I think that the process and tradition of QSLs is quite delightful, I am sensitive to the fact that the whole rigmarole is not everyone's cup of tea.

Unfortunately, many awards and distance record etc, require copies of confirmation cards etc. This is a procedural matter, however I rather wonder whether we are making the whole process more elaborate than necessary; if two stations send in their details, couldn't we just trust them? I guess we have done things this way for so long, there is little chance of change. Some of the reasons do actually have some foundation — say, if you receive a card with outright errors in the reports, times or whatever, then you know you cannot claim the contact as relevant. In the final analysis, we rely on the recognisance of the individuals involved.

> ***"... they feel compelled to include candid shots of their wives wearing nothing more than their birthday suits ..."***

Overall, unless a system can be developed with greater ease and efficacy, we are stuck with our present lot and ought to attempt to make it work as smoothly as possible.

For the amateurs who collect cards from a bureau and file them in the cylindrical filing cabinet (ie the bin!) you are just ignoring the problem of a less-than-perfect system and making it *far* worse.

If you have no intention of replying with a card, examine the details of the contact and decide whether the purported contact took place, write confirmed and sign their card and submit it to the outward bureau on the spot. Then you can forget that card for good!

Ignoring the issue of QSLs just adds to your long-term frustration; put yourself in the place of the fellow who places infinite value on receiving some sort of confirmation from you. Taking the cards and kidding yourself about your intention is sloppy and unnecessary. A little care and courtesy costs nothing. Just like receiving a bill, although far less onerous, your QSLs only have to be attended to, just once...

Have a happy Christmas, and don't forget the holiday contest activity on VHF and UHF.

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## Proposed changes to CBRS Class Licence

# AUSTRALIAN ASSOCIATION OF CITIZEN and BAND RADIO OPERATORS Inc.

**Trevor Colwell reports on the latest from ACBRO**

On October 14 last the Australian Communications Authority (ACA) issued a discussion paper on suggested changes to the Class License which covers CBers in Australia and, with ACBRO's assistance, it was distributed to affiliated clubs and others who it felt would be interested.

The changes envisaged were to permit the use of Telemetry and Telecommand Services on the CB band, particularly the UHF band. These terms which were briefly explained in the paper would have left many readers up in the air in grasping a full understanding of what they were being asked to comment on.

The ACBRO committee also was a little perplexed as well but secured the knowledge of one of its team to fully explain with diagrams on a blackboard exactly what was intended. Most who sat at the committee meeting at which this was a major agenda item, could only accept that this was another form of 'SelCall' that most users of the band could do without. The letter accompanying the discussion paper gave the best lead to what this was all about, where it proclaimed...

"...The Australian Communications Authority (ACA) has received submissions from persons wishing to use UHF CBRS equipment on rural properties for various purposes, including the provision of status reports about electric fences and water tanks and the remote control of farm equipment, such as irrigation pumps. In a radiocommunications sense, these applications are telemetry and telecommand applications...".

The ACBRO committee could see a number of problems with the proposal which considered areas that could be 'rural' where such devices could be used, and the consideration being presented in the paper that channels could be allocated for specific use. It was agreed that with the loss of such as repeater channels, the 'call' channel and the 'road' channel from the original 40-channel allocation, CBers around Australia would not welcome more erosion to the remaining channels on which normal communication could occur.

So this was the start of the notes made to enable the submission called for to commence. The questions posed in the discussion paper outlined in the foregoing provide a little bit of understanding of the issue, and ACBRO's response was a bound submission of more than 15 pages, which not only stated its opinions in answering the questions, but provided alternative suggestions which may be of benefit to all who would be entitled to use the citizen's band.

On page three, a brief criticism was made where it was implied that the UHF part of the CBRS was used for 'business' primarily over that of safety and recreational purposes. Comments on page four related amongst others to the short time frame for response, where only four weeks was allowed for submissions to be made. With mailing out of the documents, and their return by the same means, almost a week of the time for discussing the paper was lost. Most recipients would have needed more time than three weeks to call meetings of members to assess the issue, leaving no time for the formal response as was necessary. This complaint was also aired by others known to have received the invitation to submit.

One page of ACBRO's submission emphatically said ***NO*** to the introduction of Telemetry and Telecommand Services in the CBRS, but it invited the consideration of other options that were provided. The questions and the answers given by ACBRO are as follows... (for clarity, the *ACA questions are in italics*, while ACBRO responses are in normal type):

***ACA**: Without limiting the scope of the representations, comments are particularly sought regarding: • on which frequencies, if any, telemetry and telecommand transmissions should be allowed within the existing UHF CBRS spectrum;*

**ACBRO**: None — subject to alternate changes offered as a further suggestion.

*• the proposed principles of operation*

*1. The operation of all devices in CBRS spectrum must accord with the CBRS class licence and applicable device standards;*

Yes — Most certainly

*2. The operation of telemetry and telecommand within the CBRS UHF spectrum would be on a no interference, no protection basis. This means, telemetry and telecommand communications must not cause interference to voice communications;*

Certainly, Telemetry and Telecommand must not cause interference to voice communications. BUT, if it does, "No interference, no protection". THIS IS A WORRY.

*3. To assist in minimising the potential for interference to voice communications, each individual telemetry or telecommand system must:*

*a) be fitted with a 'transmit inhibit' feature that prevents the device operating when the channel is in use;* The effectiveness of the known 'transmit inhibit' leaves a lot to be desired for the reason: In many cases when groups are on a common frequency some stations cannot hear a station that perhaps the group leader can. If the station fitted with the inhibit was in a similar position to one of the group who could not hear a transmitting station, it would fail to 'inhibit' and thus transmit to the detriment of the group using the channel. This is a general weakness of such inhibit systems and should not be in any way discounted.

*b) be fitted with a feature that shuts the transmitter down after a three-minute period of continuous operation;* This appears to be a necessary 'fail safe' operation but is indicative that problems can be anticipated which cannot be tolerated. It also implies that data of up to three minutes is permissible.

*c) operate on a duty cycle of no more than 10 per cent in any hour;* Re above — two three-minute transmissions per hour would be permissible. The possibility of nuisance to the accepted voice traffic could be considerable.

*d) employ directional antennas at remote stations;* Such is indicative of wisdom in design being shown, but relating to 3 a) previously mentioned this may reduce the 'inhibit' facility with the result of dual transmissions occurring on the same channel which would probably represent a background interference to voice traffic.

*4. A telemetry or telecommand device must not be operated to gain access to a CBRS Repeater; and*

By all means, — a necessary requirement.

*5. Telemetry and telecommand transmissions will not be allowed on emergency channels or calling channels.* Again, — a necessary requirement — but who knows? Tomorrow's lobby may be to have same for some currently unthought of facility.

*• What, if any, geographical restrictions should be placed on telemetry and telecommand transmissions and the practicality of enforcing compliance with geographic restrictions on class-licensed devices?*

Providing for telementry [sic] and telecommand services in the rural areas is appealing and should be accommodated in a way that will not affect the current well-established service and facilities.

Geographic limitations would provide scope to cater for those assumed to be in need. However, the ability of the authorities to maintain adequate control of the CBRS is judged to be lacking, and the introduction of such as telementry [sic] and telecommand could only be expected to erode the facility for which the CBRS was derived, with no promise of additional policing of the bands.

*Additionally, in order for the ACA to ascertain whether the standard AS/NZS 4365:1996 may need to be modified, comments are sought from interested persons about whether it is more likely that a separate plug-in unit would allow the delivery of telemetry and telecommand applications, or whether telemetry and telecommand applications would be delivered through a modification of the base CBRS unit.*

Logic would dictate that there are many advantages in accommodating this need with a separate plug-in device. This could assist servicing the main unit in the event of need, or isolating faults, without taking the complete unit out of service, and perhaps permit in the event of a fault with the main transceiver, permitting the unit to be replaced by a spare unit into which the "plug-in" device could be attached.

Furthermore, in the event of the transceiver being disposed of on the second-hand market, perhaps away from the rural area, the new owner would not be in possession of a device which later could be used to commit nuisance as is currently the case with the accepted 'SelCall' facility.

In avoiding appearing totally negative to progress, ACBRO devoted several pages under the heading of "option", which showed of the 40-channel allocation on UHF with repeater up and down links, the call channel and the road channel, it provided only 22 channels for normal use. It went on to say...

The inquiry calls for other channels to have specific uses, and thus would erode to some degree the channels available for their original intent "talking". Added to the fact that some also have expressed keen interest in having channels available for "packet radio" and the like on the UHF citizen's band, time will come when to provide the desired facilities, extra channels will be a necessity.

Thus the suggestion is presented that the authorities with the Standard-makers should examine the idea of having the UHF CBRS made into an eighty (80) channel band. With improvement to technical design as is current with modern equipment, consideration could be given to reducing the channel spacing to double the number of channels, perhaps then creating "A" channels to accommodate the ongoing additional need, such as Channel 1, 1A, 2, 2A etc.

Thus the status quo could remain, current users could continue operating on the known 40 channels, and some of the new channels could be appropriated to specialised use. The new channels not so specified could also be used for voice as operators had their equipment modified.

As the users of the service that seek telementry [sic] and telecommand facilities will have need to outlay for the appropriate modifications, the additional one of having the unit upgraded to 80 channels would not necessarily be a great impost.

Conventional users of the service should be unaffected, and the need to update their equipment would be optional.

Other specialised use requests could thus be looked at with a view to maximising the use of the band allocated to the citizens, many of whom use the facility for hobby purposes in addition to those covered by the original intent when the service was established.

Hence, it would appear that this proposal as an option is technically feasible and its introduction and implementation could achieve the desire of the discussion paper, and not offend those who currently oppose the changes sought. In fact benefits to them may be received with delight if the 40-channel current allocation is upgraded to achieve gain of the losses which were controversial when repeater licenses were approved which eroded into the previous space where normal operation was accepted.

***ACBRO's submission was quite long. We will continue on this theme next month.***

## Editor's response...

*This magazine does not often respond to the comments made by its contributing editors, but we feel on this occasion that comment is inevitable, and vital, for we fear that ACBRO has either misunderstood the ACA's purpose in introducing this topic or its committee simply doesn't understand the technology involved.*

*The ACA approached ACBRO as a representative body for CB operators, and appears to have approached other groups as well, given some of the mail we've received in the past few weeks. Most of the feedback we've received from other people was cautiously in approval of the proposal, subject to certain fairly strict controls being put into place.*

*The general consensus of opinion is a guarded yes, with data operation limited to a five- or 10-channel block, probably being Channels 21 to 30 or 26 to 30. The idea would be that a prospective data operator could listen to the block of channels in his region, and pick one that didn't seem to have much regular operation. (Remember that this proposal is aimed at rural users, not metropolitan business users!)*

*Perhaps a brief idea of what's involved would be in order...*

*Let's say a farmer has installed one of Paris Radio's intriguing WeatherVox units on the other side of the property, or perhaps a Kantronics KTU he bought at Daycom. These devices hook up to a number of external sensors (wind, rain, temperature and so on), and can transmit the readings, both instant and stored for the previous day, back to a "base" unit. The KTU uses packet radio, while the Paris uses voice.*

*Perhaps our farmer wants to monitor the rainfall and wind patterns to find out the best spot for a new dam. There's no phone line anywhere near the spot, and it's simply not practical to run 2km of wire for a temporary installation. Instead, he puts a 100mW transceiver into a directional antenna pointed at the homestead. Brief bursts of data, only a couple of seconds long, transmit the data back to the farmer's computer on demand so he can build the area's picture.*

*If he does this on a commercial channel with no licence he risks prosecution, and may well interfere with a vital service. Applying for a commercial licence could cost thousands. Again, it's not really all that practical. But why not run this flea-powered operation on UHF Channel 27, for example? It's highly unlikely that a transmission of this nature would extend over a range of more than a kilometre or two.*

*So that's the **telemetry** side of things. Another proposed use is **telecommand** which could, for instance, see a remote receiver hooked into a device which listens for an incoming signal carrying a command sequence to switch a device on or off. It could be anything — open the solenoid to a watering system for stock or crops, open or close gates, switch a lighting system on and off, controlling the movements of a video surveillance camera — almost anything which needs an on/off input or variety of commands.*

*We've recently looked at an amazing little gadget from Paris Radio which is designed for just this purpose. The Auto-Kall AK-16 DTMF/X-10 Controller uses DTMP tones (just like the ones from your phone at home) to turn a group of relays on and off, and it gets its input across a remote radio link.*

*Although the review hasn't yet appeared, take it from me the device works, and well. But look again at what gadgets like this do. Would there be a continuous stream of commands going back and forth? Well, no. In fact, there might only be one or two short transmissions a day. And, what's more, at low power somewhere in the outback.*

*Perhaps the ACBRO committee has overreacted to what it sees as a threat. Frankly, if the ACA approves the sort of limited use its release indicates, we don't think it would have any significant impact on normal voice CB use — if any at all. Now let's look at some of the specific ACBRO points:*

*The ACA wants to ensure all manner of safeguards are in place. "...would be on a no interference, no protection basis...", said the proposal in Point 2. That means that these services are not allowed to interfere with any voice transmissions whatever — that's the ACBRO people. It also means that these devices would have no ACA protection in law if other channel occupancy means it cannot transmit. ACBRO and all voice users are the clear winners here! So why does ACBRO say this provision is such a worry?*

*The ACA's Point 3a refers to a transmit inhibit feature, which is used by — amongst others — the amateur radio community for its packet radio transmissions. These measures are, in the main, quite effective at controlling activity on a channel, and are also used extensively across the commercial spectrum.*

*Point 3b specifies a fail-safe timer, to kill a transmission after three minutes in case of fault. Tell me, ACBRO, when was the last time your UHF transmitter jammed on? This is simply a fail-safe device, not an admission that data transmissions somehow glue up your PTT button! Oh, and simplex packet transmissions, for instance, rarely last longer than about five seconds or so. Frankly, given the behaviour of many voice operators in suburban areas, we'd be as happy to see three-minute timers installed on all CB transceivers!*

*We greeted ACBRO's response to the ACA's Point 5 with incredulity. Don't be silly! The ACA is simply stipulating that these transmissions would be restricted to operating away from any repeater channel, call channel or emergency channel... what more can you ask? Later, the ACA asks about plug-in devices or all-in-one units. Another point to consider is that, were it an all-in-one unit, the radio would need to be specifically manufactured for this purpose as well, probably making it far better suited to the task.*

*As well, it's not likely that this kind of expensive specialist equipment could later be used to "commit nuisance". As transmissions are generally initiated by the data device not its operator, it's unlikely that nuisance transmissions could be made, particularly if it were not even fitted with a microphone! Also, as a busy channel transmit inhibit device would be mandated along with time-out timers, deliberate interference or jamming could only last for a very short period. It would be far simpler to put this transmitter to one side and simply use a standard one, particularly when you cannot conveniently 'swear' in data, only in voice! You have to understand that most digital devices have to be remotely interrogated in order to produce a response. Few of them just bounce into life on their own and start chirping.*

*Finally, we don't want to pour cold water on good ideas, but very few of the current crop of purpose-built 477MHz CB transceivers would easily lend themselves to 12.5kHz channel spacing. Their receivers would not cope, the microprocessor brains would generally need to be replaced... oh, lots of nasty problems. However, introducing new 12.5kHz radios to work alongside the old ones would be quite feasible, but many of the older radios would suffer quite badly from co-channel interference much of the time. There would be no way to overcome this.*

*What do you think? Please write — as soon as you can — to **CB for the 21st Century**, Radio and Communications, Box 1 Yarra Road, Wonga Park, Vic 3115, or email to **randc@tbsa.com.au***

# DX & BAND REPORT

Compiled by Jim Smith, VK9NS
PO Box 90, Norfolk Island,
South Pacific 2899

I arrived back on Norfolk Island a few days ago as I write, a couple of weeks earlier than planned. I was unable to go to Bangladesh with confidence due to having my wallet (containing my credit cards etc) stolen in New Delhi. In travelling around, with considerable excess baggage and the like, one needs the backing of a good credit card to cover all eventualities.

I spent more than two weeks in New Delhi and was able to operate using my VU2JBS callsign, and even with limited time available was able to make some 3,500 QSOs, mostly on CW. More of India later...

One of the things about having been away for any length of time is the sheer volume of things to do when one returns. Our paddock slasher went berserk while I was gone, kindly mowing through the middle of the 40 metre array, which created havoc with the main feedline and antenna switching line etc. So why did the damned thing go right through the centre?? I have no answer to that question (and the irascible slasher isn't talking) but to me it spells work that I could do without... Then again, maybe I will give the system a good 'going over' to last for the next few years. Now there is optimism for you!!

Anyway, it's good to be back, and thanks for bearing with me and the column over the past couple of months or so. It was nice to have the odd QSO with VK and ZL stations from the UK and India. My daily CW sked with XYL Kirsti, VK9NL was usually okay.

Needless to say, it will be the next issue before things get back to normal with the column as once again it will reflect what has been worked and heard from this location.

### South Shetlands, LU

It is reported that Hector, LU6UO; Ernie, LU4AXV and two other operators will be active on CW signing **LU1ZC** from Deception Island in the South Shetland Group. They may also visit other Argentinian Bases as they travel on the Argentinian ice breaker.

**QSL Route** for **LU1ZC**
Raul Diaz, LU6EF, GACW, PO Box 3,
1875 Wilde, Buenos Aires, Argentina

**R1ANF** is still very active from the Bellingshausen Base on King George Island. (I worked this one from VU2JBS.)

**QSL Route: DL5EBE**

Dan, LZ2UU should be active in December signing **LZ0A** and this is from the Bulgarian Base (St Klimenet Ohridski) on Livingstone Island.

**QSL Route: LZ1KDB**

### Burundi, 9U

Alex, PA3DZN will be based in Bujumbura in Burundi for at least three months and he has requested the call **9U5L**. He should be active as I write this.

Alex is a well known DXer and, over the years, has been 9X5EE, 9Q2L, 9R1A, D25L and ZS6/PA3DZN. The manger below can answer cards from these logs.

**QSL Route: PA3DMH**

Note: Alex is currently using the station of Alfredo, 9U5CW.

### Kure Island, K7K

The recent operation from Kure Island signing **K7K** was apparently very successful with some 25,000 QSOs in the log. In the UK they were usually very weak and I listened to them from time to time during my stay.

Colour QSL cards are being printed in Japan and QSLing will start immediately the K7K cards are received by the manager.

**QSL Route: KE7LZ**

### Midway, K4M

If you worked **K4M** after the K7K operation this *was* legitimate.

**QSL Route: KE7LZ**

### Spratly Islands, 9M

The planned DXpedition by the Chiltren DX Club from Layang Layang for February 12 to 24, 1998, is on track.

The callsign **9M0C** is to be used and two full weekends of operating will be available. This should assist the needy with getting a good chance of a QSO.

Four operating positions are planned. CW, SSB and RTTY modes will be available and the target QSO total is 40,000. Further details will be given as they become available.

### Greece, SV

Charles, ex-S92SS and Leslie, ex-S92YL now have their Greek callsigns which are **SV0LM** and **SV0LN** respectively.

**QSL Route** for both:
Charles (or Leslie) Lewis,
PO Box 1001,
GR-67100 Xannthi,
Greece

### Togo, 5V

As I write this the big Voo-Doo Contest group should hit the bands for the CQWW CW Contest weekend. Callsign is to be **5V7A** and it really looks as though they mean it judging by the number of operators and the amount of gear etc. We wish them luck from this rare location.

**QSL Route**:
Tom Wylie, GM4FDM,
3 Kings Crescent,
Elderslie,
Renfrewshire,
Scotland.

Note that this address applies to the 5V7A 1997 *Contest weekend* operation only, as the station was active either side of the contest. You can QSL for its non-Contest QSOs as below. The many operators of 5V7A will also operate outside the contest, and will QSL as follows:

| | |
|---|---|
| **5V7A** | **G3SXW** |
| **5V7BG** | **N7BG** |
| **5V7BV** | **W6RGG** |
| **5V7JL** | **K7GE** |
| **5V7MB** | **N7MB** |
| **5V7MF** | **KC7V** |
| **5V7PN** | **K7PN** |
| **5V7RF** | **GM3YTS** |
| **5V7VT** | **K5VT** |
| **5V7ZM** | **G3ZEM** |

### Iran, EP

It is noted that the EP QSL Bureau now has a new address:
EP QSL Bureau,
Director General of Communications,
Ministry of PTT,
Dr Shariati Avenue,
POB 11365-931,
16314, Iran

Note: **EP23TIE** was reported active to commemorate the 23rd Teheran International Exhibition.

### Madagascar, 5R

Ray, **5R8FK** reports problems with his incoming QSL mail being pilfered at the local level. He has decided to use his stateside address and have cards forwarded in bulk to him on a regular basis.

**QSL Route: NY3N** (home call) CBA.

## North Cooks, ZK

The recent operation signing **ZK1XXP** from Penhryn Island had two stations on the air for just over five days. The group had the usual problems with gear and so on usually associated with DXpeditions.

The QSO total was 15,299 and it is nice to see those 12 and 10M QSOs listed. Conditions on those higher bands are certainly beginning to improve.

**QSL Route**: WA4YBV direct or via WA4 QSL Bureau.
Robert Pond, WA4YBV, 9 River Cove, Portsmouth, Virginia 23704, USA.

## Special callsigns

There may be some confusion over the **VI0ANRE** and **VK0ANRE** callsigns used recently. That's hardly surprising — but one is nowhere near Antarctica while the other is the genuine chilly thing!

**QSL Route** for **VI0ANRE** (Australian mainland):
Alan Roocroft, VK4AAR, c/o Post Office, Dalveen, QLD 4374
**QSL Route** for **VK0ANRE** (Macquarie Island activity):
Simon Trotter, VK1AUS, GPO Box 600, Canberra, ACT 2601

## Tristan Da Cunha, ZD9

Ian, **ZD9IL** is very active these days, and is also reported active on 12 and 10M. (I heard him on 15M while I was in New Delhi.)

**QSL Route**:
Edwin Musto, ZS5BBO, PO Box 211032, Bluff 4036, South Africa.

Note: update logs are only available to the manager every three or four months, so be patient with this one.

## Uganda, 5X

There seems to be plenty of activity from Uganda these days and Stefan, **5X1S** is reported to be very active on several bands.

**QSL Route** for **5X1S:**
Stefan M Bauer, TSU, c/o UN WFP, PO Box 7159, Kampala, Uganda

**QSL Route** for **5X1T**: **ON5NT**

## Antarctica, VP8 etc

Pavel, **EM1HO** expects to go QRT in February 1998. He has been very QRV and has also been on RTTY.

**QSL Route**: **I2JPA**

Valentin, **R1ANZ** is also very active and often on 40M CW. Note that the QSL Route is his home call, so cards may take time. **QSL Route**: **RU1ZC**

## Liberia, EL

It is reported that Joe, K3KN who had been signing **EL/K3KN** now has a Liberian Callsign, **EL2JR**. This is good news as Liberia is very rare these days. So far, I have no word if this operation is valid at DXCC.

**QSL Route** for both **EL2JR** and **EL/K3KN**: **KB3U**

## French Polynesia, FO

The recent spate of FO calls were the result of the many operators for the CQWW SSB Contest using their own calls outside the contest weekend.

**QSL Routes**:

| | |
|---|---|
| FO0BRD | N6RT |
| FO0KEO | KA7CQQ |
| FO0MIT | W6RW |
| FO0PLA | W8AEF |
| FO0SPE | KG6AR |
| FO5VO | N6VO |
| FO8DX | KG6AR |

*to page 75* ....☞

## QSLing the *right* way...

Once again via this column I will try to give a few pointers on QSLing. The subject reminds me of the annual recycling of material in, say, a women's magazine — how to do this, how to do that and so on. However, it is also true to say that the hobby has many radio amateurs new to the world of QSLing. Of course many just don't bother with QSL cards, don't bother with DXCC, don't bother with IOTA etc. So be it.

Australian amateurs seem to have acquired a terrible reputation for QSLing. In the RSGB's member journal, *Radcom*, a G station had recently been slated over his alleged slow QSLing in respect of his activity from an African country. I read the original material and could feel my hackles rise.

The current *Radcom* now states that 'numerous' letters had been received in reply to the comments, saying that the writer had received a very prompt QSL card from the said 'baddy'! However, what caught my eye was the statement of one writer... "I received a very quick QSL card from 'Joe', but can anyone tell me why VK stations do not QSL, either direct in response to SAE and postage or via the bureau?" An isolated instance? Well, apparently not — there have been several recent references to VK QSLing. Do *you* QSL??

Does the bureau work for you? Give a rough count of QSL cards sent to the bureau and a rough count of numbers received — say over a one-year period. Is QSLing direct working for you? Name a couple of 'Hard stations'!

### QSLing to Box 88, Moscow

QSLing Russian stations via the QSL Bureau used to be easy — no choice and no messing around — via PO Box 88, Moscow, was the *only* way to go. This was in spite of the fact that there were numerous countries (in every respect) within the USSR.

The Krenkel Radio Club, PO Box 88, Moscow, still exists, but may no longer be a recognised IARU route. It should be noted that the IARU stipulates that each country should have only one QSL Bureau (that makes sense) and it appears that the official bureau for Russia is now: **PO Box 59, Moscow, Russia**.

The KH2, Guam QSL bureau has reached a stage of melt-down with thousands of QSL cards in its Bureau system with no takers. Most (but not all) are the result of visiting amateurs (who may well have done the right thing during the QSO over a QSL route) and no leads as to how to get rid of the QSL cards. Sadly, it is a story repeated *ad infinitum* over the world as amateurs still commit QSL cards via their respective outgoing QSL bureaus with no regard to the consequences.

I repeat here for absolute clarity that one should QSL via the bureau *only* if this has been the accepted method at the time of the QSO. Any other move means that you are at least 50 per cent wrong with 500 of your outgoing 1000 Bureau QSL cards heading for limbo.

Generally speaking, I have found QSL managers to be very reliable, with any exceptions usually due to the DX station not supplying logs. With no logs, a manager cannot QSL.

A few individual DX stations have taken a hammering over the years, but they are still in the tiny minority. Never re-QSL more than twice for a needed card until you have done some leg work.

You will have noted an earlier reference to that 5R8 station having his mail pilfered — he may well end up with a 'lousy QSLer' tag for a while.

# ISLANDS ON THE AIR (IOTA)

By Jim Smith, VK9NS

During my travels in recent weeks I have kept an ear on the activity on the IOTA channels and have a few calls in my logs. One thing is obvious, and that is that the IOTA program continues to grow and several new IOTA numbers have been issued. It also means that I have missed a few new ones myself but this can't be helped.

Conditions were quite good in India, and propagation to Africa, Europe, Asia and South America was very reliable, however QSOs with North America and Oceania were much harder.

There were some big pile-ups on and near 14,260kHz (the IOTA 'channel') on several occasions and several QSOs were made with various islands. The station was quite modest with a Kenwood TS-690S and multi-band vertical HF6V.

It was nice to see that several IOTA cards were awaiting my return and several new ones are now confirmed. For example;

| | | | |
|---|---|---|---|
| AF-087 | Carabane Island | 6W2/F6BUM | April 1997 |
| AS-084 | Ha Chu Ja Do Island | HL0Z/4 | August 1997 |
| AS-085 | Bo Kil Do Island | HL0Z/4 | July 1997 |
| AS-093 | Dae Hek San Do Island | HL0Z/4 | July 1997 |
| AS-129 | Wai Ling Ding Island | BD7JA/7 | August 1997 |
| EU-069 | Illes Columbtretes | ED5HQ | August 1997 |
| EU-077 | Isla Coelleira | ED1OCV | July 1997 |
| EU-122 | Rathlin Island | GI/EI7NET | June 1997 |
| EU-127 | Neuwerk Island | DJ3XG/p | May 1997 |

## IOTA activity

The following is some recent IOTA activity and is listed here for your information. IF9/IT9FXY was worked this morning, and he was very strong here on Norfolk Island. It will take me a little time to get myself organised and back on the IOTA chase.

| | | | |
|---|---|---|---|
| AF-003 | ZD8V | Ascension Island | See below |
| AF-018 | IF9/IT9FXY | Pantelleria Island | IT9FXY |
| AF-049 | 3B8/F6HMJ | Mauritius Island | F6HMJ |
| AS-004 | 5B4AGC | Cyprus | See below |
| AS-008 | JQ1ALQ | Toshima Island | JA1EPL |
| AS-117 | JH4FHV | Innoshima Island | JH4FHV |
| AS-130/p | 3W5KVR | Con Son Island | QSL see below |
| EU-002 | OH0TA | Aland Island | OH2TA |
| EU-024 | KE8RO/TF | Iceland | KE8RO |
| NA-005 | AJ2U/VP9 | Bermuda | K1EFI |
| NA-015 | T48RCT | Cuba | SK0UX |
| NA-021 | 8P9DX | Barbados | VA3DX0 |
| NA-032 | FP8EK | St Pierre et Miquelon | K1RH |
| NA-054 | N5XG/C6A | Bahamas | N5XG |
| NA-097 | 6Y4A | Jamaica | WA4WTG |
| NA-100 | V26ED | Antigua | WA3WSJ |
| NA-100 | V26KW | Antigua | K3TEJ |
| NA-100 | V26E | Antigua | AB2E |
| NA-102 | FG5BG | Guadeloupe | JF2DQJ |
| OC-032 | FK8GM | New Caledonia | WB2RAJ |
| OC-060 | 3D2RW/R | Rotuma Island | ZL1AMO |
| OC-129 | KE6UP/DU6 | Philippines | KE6UP |
| SA-029 | ZW1A/ZW1A | Ilha Grande | See below |
| SA-030 | CW1D | Flores Island | See below |
| SA-039 | CW5R | Isla De Lobos | See below |

## New IOTA numbers

Over the last year the new IOTA numbers have been documented in each column, however the following listing should help you to check your IOTA Directory or information to ensure that it is up to date.

| | | | |
|---|---|---|---|
| AF-076 | 5N4 | Gulf of Guinea Group | (b) |
| AF-077 | ZS1 | Cape Province South Coast Group | (d) |
| AF-078 | 6W | Senegalese Is - Atlantic Coast Sth Grp | (b) |
| AS-125 | HS | Thailand - Gulf Of Thailand NE Grp | (a) |
| AS-126 | HS | Thailand - Butang Group | (f) |
| AS-127 | S2 | Bangladesh - Chittagong Region Group | (a) |
| AS-128 | XV/3W | Vietnam - Mekong Delta West Group | (c) |
| AS-129 | BY7 | Chinese Is - Guangdong Prov East Grp | |
| AS-130 | XV,3W | Vietnam - Con Son Group | (b) |
| OC-217 | YB3 | Indonesia. Kangean Island | (e) |
| OC-218 | FK | New Caledonia. Mathew Island | (e) |
| OC-219 | YB8 | Indonesia. Tukanbesi Island | (u) |
| OC-220 | VK5 | South Aust Islands - SA West Group | (c) |
| OC-221 | YB8 | Indonesia - Moluccas | (j) |
| OC-222 | YB8 | Indonesia - Moluccas | (m) |
| OC-223 | VK2 | New South Wales State South Group | (c) |
| OC-224 | YB8 | Indonesia - Moluccas Group | (p) |

NB In some cases the numbers issued are provisional but should become valid for credit very soon. In each case the **Little Letter Number** is shown at the far right.

## QSL information

**3W5KVR** (for JA only): JI6KVRT, Y Deguchi, 4796 Takashima-cho, Yatsushiro, Kumamoto 866, Japan.

**3W5KVR** (for non-JA): EA5KB, Pepe Erdid, PO Box 5013, Valencia 46080, Spain

**5B4AGC** PO Box 1344, Paphos, CY8133, Cyprus

**CW1D** via Daniel Muinos, CX1AK, PO Box 5, 11000 Montevideo, Uruguay

**CW5R** via CX2ABC, PO Box 2, ZC 11000 Montevideo, Uruguay

**FK8KAB** Association des Radioamateurs de Nouvelle Caledonie, BP 3956, F-98607 Noumea, New Caledonia

**G3NOM** Ray Gerrard, C/- 37 Godward Road, New Mills, High Peak, SK12 2BU, England

**KH2JU** Danny Pbre, PO Box 22061 GMF, Barrigada, GU 96921, Guam

**T32AI** via Rick Levandowski, WB0BNR, PO Box 367, Cascade, WI, 53011-367, USA

**YC9MKF** F Konay, PO Box 1021, Kupang 85000, Timor Island, Indonesia

**YE8Q** via YB8QD, PO Box 198, Mando, 95001, Indonesia

**ZD8V** Paul Hutley, KF4OOX, CSR 6310 Ascension, PO Box 4915, Patrick AFB, Florida 32925, USA

**ZV1A/PY1OB**, Labre-RJ, PO Box 58, 20001-970, Rio de Janeiro, Brazil. (SSB QSOs)

**ZV1A/PY1SL**, Labre-RJ, PO Box 58, 200001-970, Rio De Janeiro, Brasil. (CW QSOs)

## IOTA directory

The current IOTA Directory is now available from the UK. The cost is US$15 plus a further US$3 for air mail postage. The RSGB IOTA Program, PO Box 9, Potters Bar, Herts EN6 3RH, England.

However, if you send HIDXA, PO Box 90, Norfolk Island, Australia 2899 either US$18 or the Australian equivalent (cheque, cash, or Bankcard) we will order the Directory for you by fax, and it will then go in the next mail to your address. This saves you cost of a bank draft or whatever.

HIDXA is the Pacific IOTA Check Point. If you are interested in the IOTA program the IOTA Directory is a must and it is very good value. It will answer all your IOTA questions and make you much more aware of the extent of the IOTA program.

So that's it for this column, and next month should see a return to a more normal life as I settle back on Norfolk Island.

Seasons Greetings to all. 73 from Jim, VK9NS

# DX & BAND REPORT

Compiled by Jim Smith, VK9NS
PO Box 90, Norfolk Island,
South Pacific 2899

### Cambodia, XU

It is reported that Mike, **W0YZS** became a silent key in Cambodia in October. Mike was quite active as **XU6WV** but was also a well known to DXers as he has signed **VR2WV**, **VS6WV**, **SV0FE**, **SV0FE/SV5** and also **SV0FE/SV9**.

### Antarctic program awards

Amongst the mail awaiting my attention is the latest Diamond DX Club listings of the Antarctic stations which are valid for the various awards. It is a remarkable document, and it has been supported by inputs from over 70 stations which give substance to the various listings of activity.

The majority of the amateur radio activities are, of course, as a result of Antarctic research carried out under the auspices of national governments. The following countries are listed:

| | |
|---|---|
| ANARE | Australia |
| BAS | UK |
| IAA | Italy |
| MARS | USA |
| NIPR | Japan |
| NZARP | New Zealand |
| SAAM | Soviet Antarctic Meteo |
| TAAF | France |
| USN | US Navy |

The Directory **Antarctic Bases List**, listing activity since 1959, is available for US $11 from:

Massimo Balsamo, IK1GPG,
Strada Satale 28 Nord #7,
I-12084 Mondovi' (Cuneo),
Italy

So that is about it for the moment and I have several letters from VK stations to deal with over the next couple of days. Keep the letters and comments coming as it helps remind me that this is not being written to a brick wall, hi.

Thanks is due to the many who keep me informed on the air, by phone and fax and your input is always welcome. A special thanks is due to those DX outlets which help keep the DXers informed on a regular basis, and in particular to the following: **RSGB DX News Sheet**, **QRZ DX**, **59(9) DXReport**, **The DX News Magazine**, **Les Nouvelles DX**, **GM DX Group Digest**, **Radio Vista**, ***Radcom*** etc.

Good DXing and 73 from Jim, VK9NS, and if it's Christmas Eve in your part of the world, Merry Christmas!

### Time for a Laugh

The following traces the history of amateur radio over a rather longish time frame; the author is unknown.

| | |
|---|---|
| 4 Billion BC ..... | Earth is swirling ball of flames. Propagation is very poor. |
| 1 Billion BC ..... | First dry land appears and is divided into Grid Squares. |
| 500 Million BC ... | Second patch of dry land appears. First DXpedition but credit disallowed because of questionable licensing agreement. |
| 400 Million BC ... | Flowering plants and grasses evolve. Telrex invents first beam but sales are slow because of lack of suitable structures. |
| 300 Million BC ... | First tree appears and is immediately cut down, stripped of its branches, placed in a concrete base and named a telephone pole. Telrex sells first beam antenna. |
| 200 Million BC ... | Second beam sold by Telrex. Installer falls from top of pole, a tree now 100 million years old. First safety belt sold. |
| 100 Million BC ... | First mountain appears. Repeater invented. |
| 50 Million BC .... | It is decided at WARC that 'seek you' is too cumbersome to send on CW so the abbreviation CQ is adopted. |
| 4 Million BC ..... | Humans replace swine as dominant species. The name 'Ham Operator' hangs on, however. |
| 3 Million BC ..... | Dugout canoe invented. Maritime Mobile Net formed on 14,313 kHz. |
| 2 Million BC ..... | Nothing much happens for a long time. |
| 800 to 900 AD ... | Chinese invent gunpowder. BY1AA first 'Big Gun' DXer. |
| 1790 AD........ | Franklin invents long wire receiving antenna. Ground switch invented. |
| 1961 AD........ | Second repeater erected. First repeater group refuses to change frequency. First repeater co-ordinator appointed. |
| 1997 AD........ | Amateur Radio humour sinks to a new low. |

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http://www.tower.visionimage.com.au

# Build an ultra compact receiving aerial for long, medium and shortwave

By Raymond Haigh

*Raymond says this inexpensive unit packs as much punch as a long, high wire, and can be built in an evening...*

Situations often arise when it is impractical or impossible to erect a decent 'longwire' aerial. Houses with very small gardens, flats, caravans, hotel rooms, all cramp the aerial erector's style, and there must be many radio listeners who have felt the need for a compact and portable means of injecting a good signal into their receivers.

The pocket-size system described here has an almost uniform response from 200 kHz to 30 MHz and delivers as much signal as a long and high wire antenna. In fact, provision has to be made for reducing output in order to prevent receiver overload!

A short telescopic rod and an impedance-matching broadband amplifier make up the active aerial, and an internal battery ensures complete portability. When separately powered, the gain of the amplifier can be remotely controlled.

## Basic principles

All aerials can be regarded as RF tuned circuits comprising inductance and capacitance. In the case of loop or frame aerials, the aerial is actually wound as a tuning coil or inductor, and the addition of a tuning capacitor makes the similarity apparent. With aerials made up of metal rods or extended wires, the inductance and capacitance are distributed throughout their length, and although the tuned-circuit action is less obvious, it is just as real. At resonance the reactance of a tuned circuit is purely resistive, but at frequencies above resonance it becomes inductive. Below resonance the reactance becomes increasingly capacitive.

Short whip aerials used for reception on long, medium and even the HF bands are responding to signals far below their resonant frequency, and they are often referred to as capacitive aerials. Their impedance is high, and car radios usually incorporate a 'pi' matching circuit to couple a whip aerial to the RF stage. For the same reason, the telescopic aerial of a transistor portable is connected directly to the 'hot' end of the RF tuned circuit when the set is switched for short wave reception.

The coil-loaded whips used for mobile HF band working and the telescopic rods used for VHF reception do not, of course, fall into this category. These aerials are designed to resonate at the signal frequency and their impedance is tailored to match the receiver's input circuitry.

Returning to non-resonant short aerials, it will be appreciated that the signal induced in a 1 metre whip will be 30 times weaker than the signal induced in a 30 metre long wire. However, a broadband amplifier can be used to raise the signal level from the short aerial and, with appropriate circuitry, effectively match its high impedance to the input stage of the receiver. If care is taken, the additional noise generated by the amplifier can be kept to a very low level.

## The circuit

The theoretical circuit of the active aerial and its remote power supply is given in **Figure 1**. Taking the amplifier first, a short (around one metre) telescopic aerial is connected via C1. This capacitor, together with RF choke, L1, act as a high-pass filter to prevent the injection of mains hum. In Australia, many

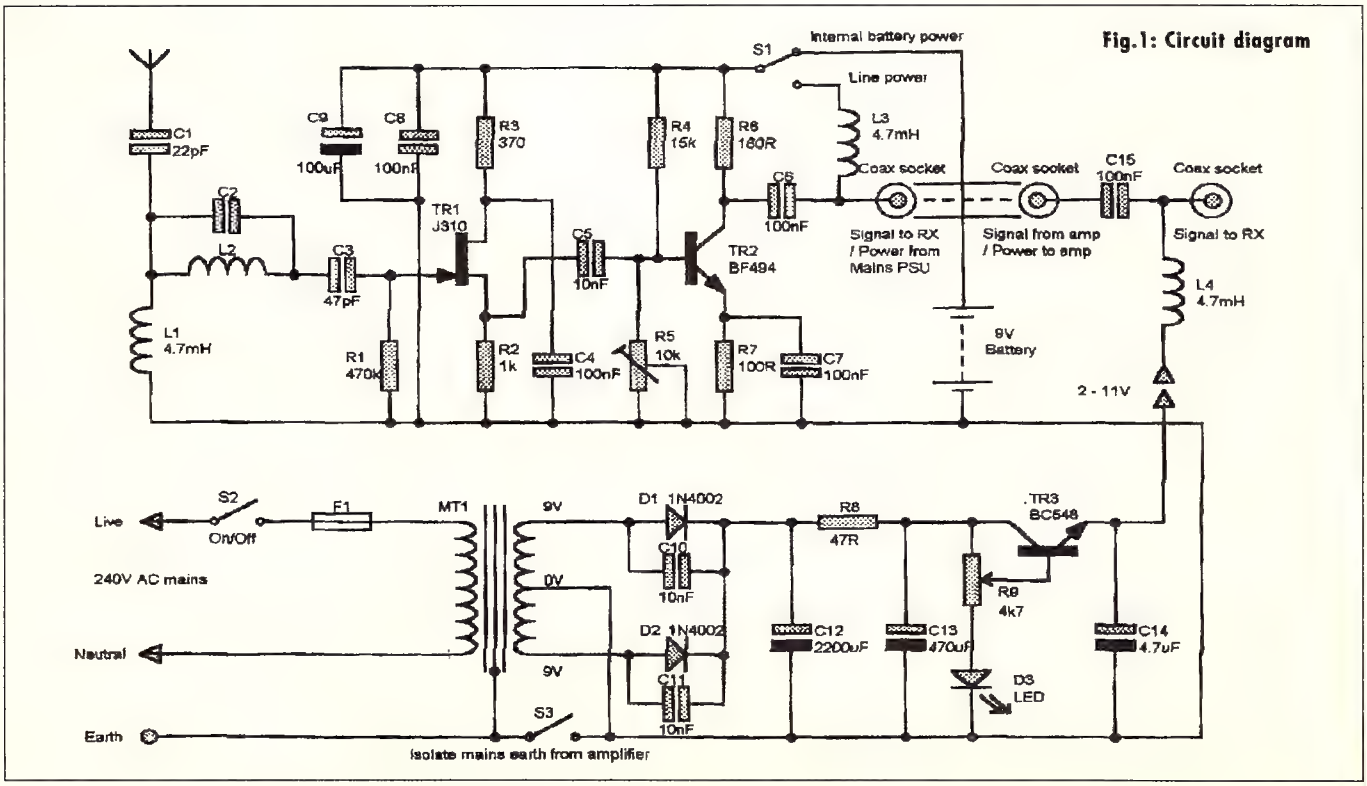

**Fig.1: Circuit diagram**

radio listeners live quite close to comparatively high-powered medium wave transmitters. L2 and C2 form a wave trap which prevents strong signals of this kind overloading either the aerial amplifier or the receiver it feeds. The low value coupling capacitor, C3, augments the high-pass arrangements, and R1 ensures correct biasing of the field effect transistor, TR1, which is configured as a source follower.

In this mode, voltage gain is slightly less than unity, input impedance very high and output impedance low — just what is needed to match the aerial to the comparatively low input impedance of TR2. The output is developed across source resistor, R2, and R3 and C4 decouple the stage from the supply line.

The signal is conveyed to the base of TR2 via DC blocking capacitor, C5. R4 and R5 are the bias network, and R5 is adjustable to preset the current flowing through the device and fix its gain. As this resistor is decreased in value, the current through TR2 falls and its gain and noise level are reduced. Emitter resistor, R7, stabilises the bias level, and bypass capacitor, C7, prevents gain-reducing negative feedback at signal frequencies. The output is developed across collector load resistor, R6.

Although the current demand of the amplifier is only of the order of 10mA, equipment of this kind is often operated for long periods and the cost of a mains power unit will soon be recovered. Moreover, it is economical and convenient to line-power the amplifier, ie, supply the power via the coaxial signal cable. The negative supply rail is easily connected via the outer braid, but the positive supply line is more tricky.

Chokes L3 and L4 present a very high impedance to the RF signals, but their resistance to DC is extremely low. Conversely, capacitors C6 and C15 block the flow of DC but offer little resistance to the RF signals. These components, located at either end of the cable, permit the positive supply to be fed down its central core along with the signal, and without disturbing the operation of the circuit. The single-pole changeover switch, S1, connects the amplifier positive rail to either the power unit or the internal battery.

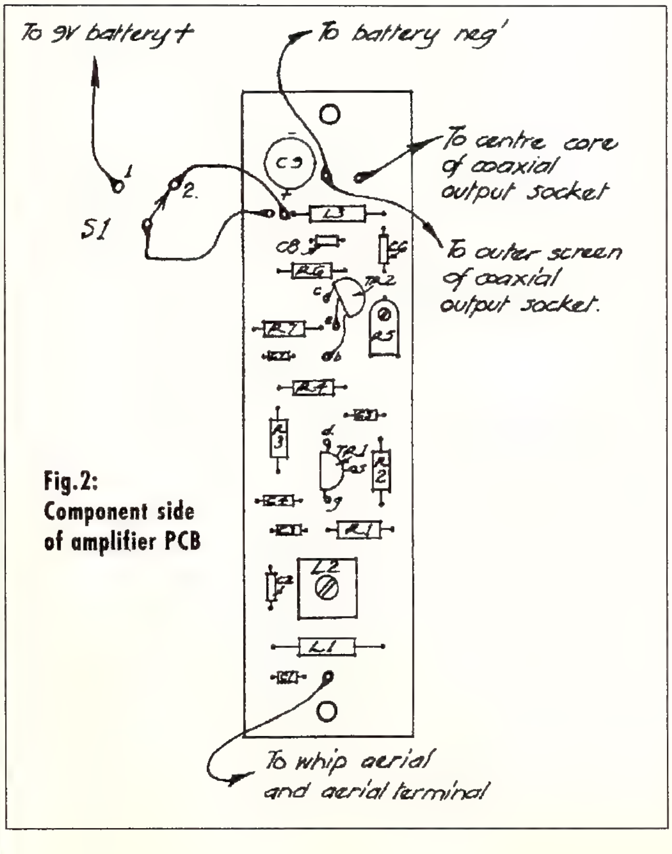
To 9V battery +
To battery neg'
To centre core of coaxial output socket
To outer screen of coaxial output socket.
To whip aerial and aerial terminal
S1
1
2.
C3
L3
C8
C6
R6
TR2
R7
R5
R4
R3
TR1
R2
R1
L2
L1

**Fig.2: Component side of amplifier PCB**

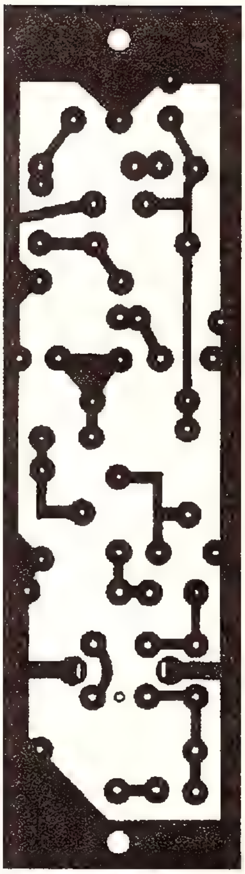

**Figure 3 (left): The copper track side of the amplifier PCB (shown full size)**

## Voltages are lethal...

Constructors who have no experience of building or commissioning mains-powered equipment should note that the voltages involved are potentially lethal. *Always* disconnect the unit from the mains before making adjustments. If in any doubt, simply power the aerial amplifier directly from its self-contained battery, or from an external 13.8V DC supply if remote powering and gain control are required. *(Ed's note - you should instead use a low cost and readily available external plug-in 12V DC power supply, as described later, if you're in any way unsure of your constructional or practical capabilities with lethal mains voltages).*

The 9 - 0 - 9V secondary of mains transformer, MT1, and diodes D1 and D2, are connected in a bi-phase, full-wave circuit. Capacitors C12 and C13, together with R8, smooth the supply.

RF currents flowing in the mains and power supply wiring can be modulated at 100Hz by the switching action of the rectifier diodes. If this RF energy is picked up by the aerial amplifier or the receiver, it manifests itself as modulation hum. Capacitors C10 and C11, connected across the diodes, suppress this interference.

The gain of the aerial amplifier can be controlled by varying its supply voltage. However, the modest 10 mA current drain may exceed the rating of some miniature carbon pots, and a more robust wire-wound component would be expensive. Potentiometer, R9, accordingly changes the base bias of transistor TR3, which is placed in series with the supply. This varies the collector/emitter resistance of the device and sweeps the on-load output voltage from approximately 2 to 11V. The potentiometer track also acts as a series resistor for a low current (2 mA) LED indicator, D3. Tantalum capacitor, C14, presents a very low impedance to RF and ensures that the power supply is thoroughly decoupled.

S2 is the mains on/off switch. Fuse, Fl, isolates the unit in the event of a fault which causes excessive mains current to flow and, as a further safety measure, the core of the transformer is connected to mains earth.

Connecting the aerial amplifier to mains earth usually improves reception. Sometimes, however, grounding the amplifier or receiver in this way impairs performance, either in terms of signal strength or noise. S3 isolates the negative supply rail from mains earth so that any differences in performance can be quickly checked.

## Using external DC supplies

An external 13.8V DC supply can be connected across C12 via the voltage dropping and decoupling resistor, R10. The unit should, of course, be unplugged from the mains when it is being powered in this way. Constructors who prefer to permanently connect the unit to their DC power supply should delete the fuse, mains transformer, rectifier diodes, capacitors C10 and C11, and switches S2 and S3.

## Components

Transistor types are not excessively critical, but a J310 FET in the TR1 position performs noticeably better than a 2N3819.

....☞

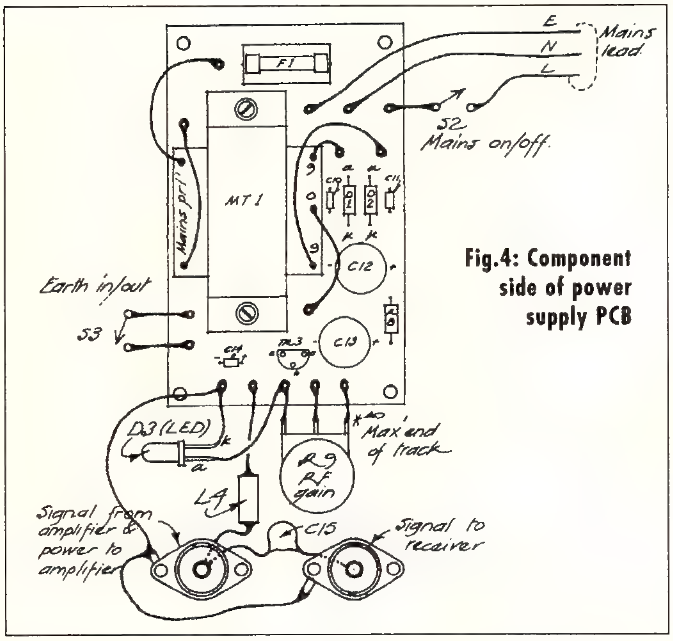

**Fig.4: Component side of power supply PCB**

J310 FETs, the Toko coil, L2, and the miniature RF chokes, L1, L3 and L4 are stocked by Daycom and Dick Smith, plus other specialist outlets. Almost any small signal, high-frequency, NPN silicon transistor will function in the TR2 position, and R5 can be set to optimise the bias for individual devices. The BC548 in the power supply is a cheaper, plastic-cased version of the BC108. Again, most small-signal, low-frequency, NPN silicon transistors should be suitable. Low current LEDs are retailed by Maplin. There is room on the power supply PCB for a mains transformer with a secondary rated at 250 mA, but a 100 mA unit will suffice in this application.

## Construction

Most of the amplifier and remote power supply components are mounted on PCBs. The component and copper track sides of the amplifier PCB are shown in **Figures 2** and **3**. The board for the power supply is illustrated in **Figures 4** and **5**, overleaf. Vero pins inserted at the lead-out points ease the task of off-board wiring.

Constructors who are swamped by a powerful signal from a MW radio station should refer to **Table 1** for the value of C2.

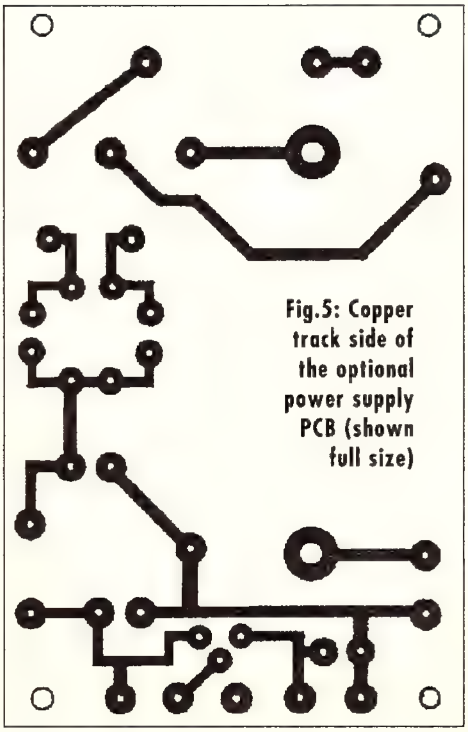

**Fig.5: Copper track side of the optional power supply PCB (shown full size)**

The values of C2 for the long wave coil can be calculated, estimated from the setting of a tuning capacitor in a radio tuned to the offending station, or found by trial and error. In areas where difficulties of this kind do not arise, omit L2 and C2 and insert a wire link to connect the 'hot' end of L1 to C3.

L4 and C15 make the connections between the power supply PCB and the coaxial socket outlets associated with it. Provision is not made for these components on the PCB.

## Housing

The power supply PCB and associated off-board components can be mounted on the lid of a standard plastic box measuring 152mm x 89mm x 47mm internally. The telescopic aerial, amplifier and battery can likewise be housed in a small plastic box.

## Setting up and testing

Check component placement on the PCBs, particularly the orientation of the transistors, diodes and electrolytic capacitors, then check for poorly-soldered joints and bridging of the copper tracks. If everything is in order, set R5 to about one-third of its resistance and connect the amplifier to a fresh 9V battery. Current consumption should be approximately 10 mA.

Extend the telescopic aerial and connect the amplifier to the receiver via a short length of coaxial cable. The receiver's performance on long, medium and short waves should be little different to its performance when a long-wire (30 metres plus) is connected.

If the receiver is fitted with a signal-strength meter, tune in a steady signal and advance R5 from zero to the point where further rotation of the pre-set results in only a slight increase in gain. If this setting results in overload (in the absence of a signal strength meter an increase in spurii is a tell-tale sign of this), reduce R5 to decrease the gain of TR2. R5 sets the bias, and hence the quiescent current through TR2. Reducing current flow reduces gain and the noise generated by the transistor.

To set the wave trap, simply tune the receiver to the offending station and rotate the core of L2 until the signal is reduced to minimum. The setting is quite critical, and if the receiver lacks a signal-strength meter, listen for the increase in noise as the AGC system fights to maintain output with a falling input. When the active aerial has been checked out on its internal battery, connect it to the receiver via the remote power unit. Rotating R9 should swing the on-load supply voltage between about 2 and 11V, varying the gain of the amplifier from zero to maximum.

## Using the active aerial

Any aerial sited within a building is usually surrounded by mains wiring and electrical equipment, and it is more vulnerable to man-made interference. However, no problems have been encountered at a town centre location, where the noise and signal-strength performance of the active aerial are not noticeably different to a 33 metre long wire erected seven metres above the ground.

Occasionally, highly localised electrical noise is a problem and, under these conditions, moving the aerial around the house, or even a room, will often enable a position to be found where the interference is less troublesome. On medium and long waves, the active aerial seems less susceptible to interference from computers and TV line output transformers than a loop aerial. In situations where localised electrical noise is a particular problem, and where some garden space is available, the unit can be mast mounted to place it where the electrical noise field is weakest.

Ten metres of coaxial cable have been connected between the amplifier and remote power supply with-

| Value of C2 | Min. Inductance (Core fully out) | Max Inductance (Core fully in) |
|---|---|---|
| 33pF | 1700 | 1300 |
| 47pF | 1400 | 1100 |
| 68pF | 1200 | 900 |
| 120pF | 900 | 700 |
| 220pF | 700 | 550 |

**Table 1**: Frequency coverage (kHz) of wave trap for Toko RWR331208 coil and alternative values of C2

out any detectable reduction in output, and longer lengths than this can probably be used without difficulty. If the unit is permanently mast-mounted, a weatherproof enclosure and whip aerial will, of course, be required.

Large metal objects, eg radiators, will screen the aerial and reduce output, but its height above ground has very little effect on signal strength. Indeed, the unit works well in a cellar. In steel-framed or metal sheeted buildings, the telescopic rod will have to be projected through a window, or other arrangements made to mount it beyond the screening effect of the 'Faraday cage'.

## Parts List

**Resistors**; all 1/4 watt 5% tolerance or better.

R1 . . . 470k
R2 . . . 1k
R3 . . . 270
R4 . . . 15k
R5 . . . 10K preset potentiometer
R6 . . . 180
R7 . . . 100
R8 . . . 47
R9 . . . 4k7 linear potentiometer
R10 . . 150

**Capacitors**; all 16V working or greater unless otherwise stated

C1 . . . 22pF ceramic
C2 . . . Close tolerance ceramic: see Table 1 for value
C3 . . . 47pF ceramic
C4 . . . 100nF (0.1μF) ceramic
C5 . . . 10nF (.01μF) ceramic
C6 . . . 100nF ceramic
C7 . . . 100nF ceramic
C8 . . . 100nF ceramic
C9 . . . 100μF radial lead electrolytic
C10 . . 10nF ceramic, 25V working
C11 . . 10nF ceramic, 25V working
C12 . . 2200μF radial lead electrolytic
C13 . . 470μF radial lead electrolytic
C14 . . 4μ7 tantalum
C15 . . 100nF ceramic

**Inductors and Transformers**:

L1 . . . 4700μH (4.7mH) miniature, axial lead RF choke
L2 . . . Toko RWR331208
L3 . . . 4700μH miniature, axial lead RF choke
L4 . . . 4700μH miniature, axial lead RF choke
MT1 . . Mains transformer, 9-0-9V
The secondary should be rated at 100 or 250mA

**Semiconductors**;

TR1 . . J310
TR2 . . BF494
TR3 . . BC548
D1 . . . 1N4002
D2 . . . 1N4002
D3 . . . Low current (2mA) LED

**Switches**;

S1 . . . Single pole change over toggle switch (an on-on type)
S2 . . . Single pole toggle switch with mains voltage rating
S3 . . . Single pole toggle switch

**Sundry Items**;

Printed circuit board materials, Vero pins, hook-up wire. Nuts, bolts, screws and washers. Control knob and LED holder. Fuse holder and 500mA fuse. Mains lead and coaxial cable. Battery and connector. Plastic cases for amplifier and power supply. Telescopic aerial, 1 metre long. Aerial terminal, coaxial plugs and sockets, mains plug, DC power input socket or terminals.

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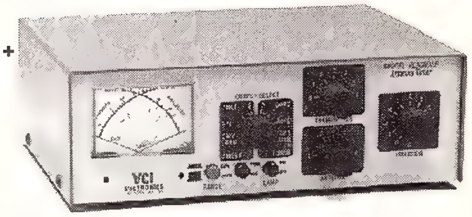

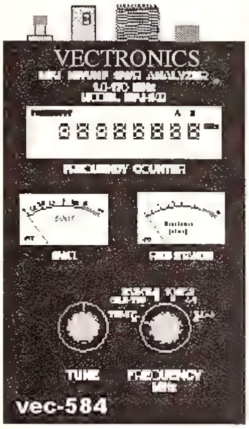

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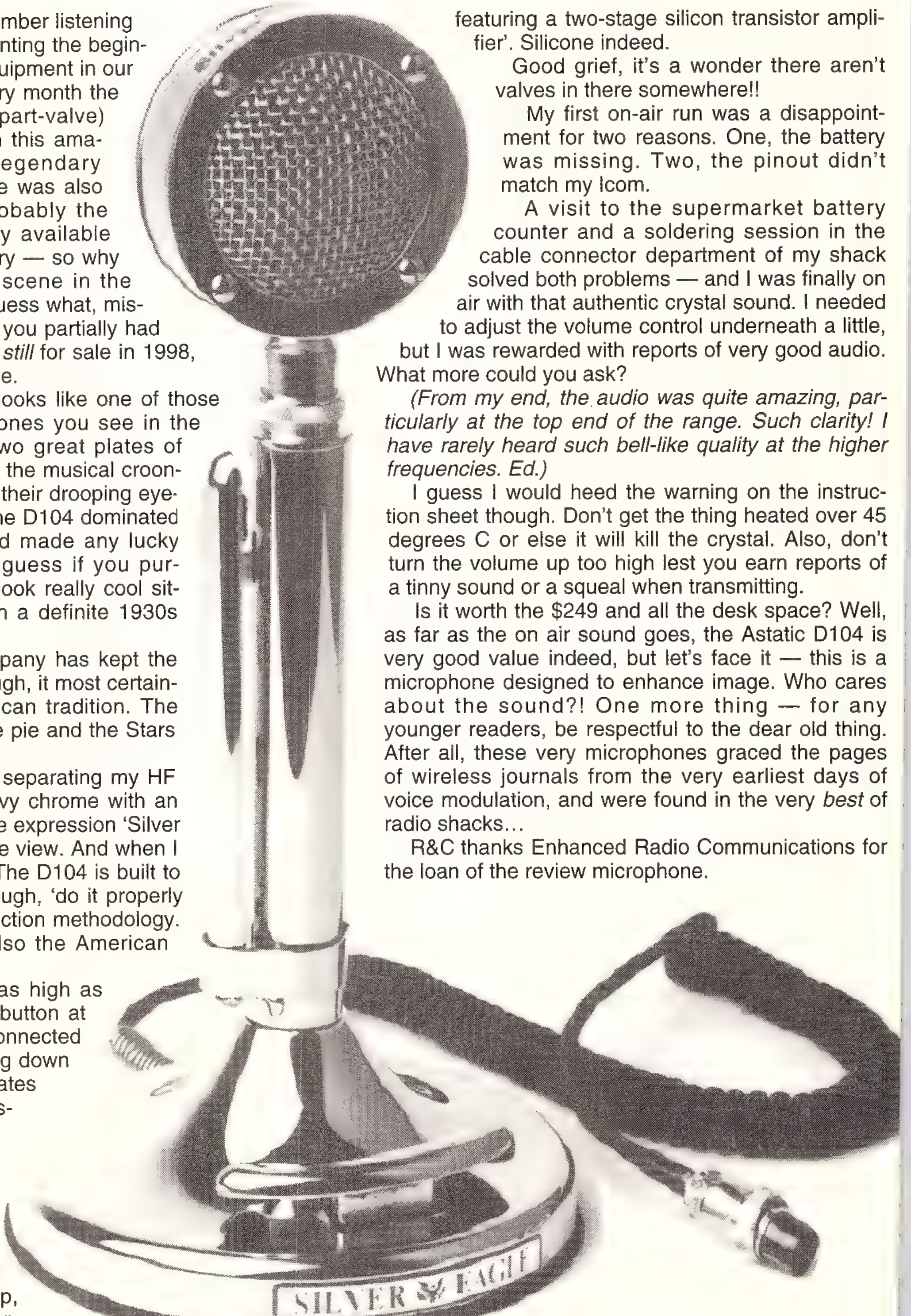
# The *Astatic Silver Eagle* D104 microphone

By Neil Duncan, VK3ND



Years and years ago, I remember listening to a station on the air lamenting the beginning of the end of valve equipment in our hobby. Apparently, during that very month the first hybrid (part-transistor and part-valve) transmitter had hit the market. In this amateur's opening remarks, the legendary longevity of the D104 microphone was also referred to. It was seen as probably the longest running, (then) currently available item in the amateur radio inventory — so why can't valve radios stay on the scene in the same way, it was argued? Well guess what, mister (if you're not a silent key yet), you partially had a point. The D104 microphone is *still* for sale in 1998, but I'm afraid valve radios are gone.

For the uninitiated, the D104 looks like one of those 1930s broadcast radio microphones you see in the black and white film classics; two great plates of metal with a grille in the front that the musical crooners of the day swooned over with their drooping eyebrows and their dreadful lyrics. The D104 dominated the radio shacks of that era and made any lucky owner a most proud person. I guess if you purchased one in 1998, you would look really cool sitting beside it in your shack, with a definite 1930s Humphrey Bogart look.

So, the American Astatic company has kept the tradition alive, eh? Well sure enough, it most certainly has — and in the best American tradition. The D104 looks as American as apple pie and the Stars and Stripes.

On the bench at the moment, separating my HF rig from me, is a face-full of heavy chrome with an eagle carved into the back and the expression 'Silver Eagle' filling most of the rest of the view. And when I say chrome, I do *mean* chrome! The D104 is built to last and is a monument to the tough, 'do it properly no matter how big it gets' construction methodology. But so *much* chrome! This is also the American way, isn't it?

Physically, the D104 stands as high as two large rigs, has a huge PTT button at its base which is mechanically connected to an even bigger PTT bar running down its side (which, if squeezed, activates the lower bar) and houses a crystal cartridge in the sealed but removable top section. The whole case is in fact made from die cast zinc and weighs an unimaginable 2.2kg.

The base has a felt underside and can be removed to change the battery. Battery? Yep, this device houses an amplifier — hence the title 'high quality, amplified crystal featuring a two-stage silicon transistor amplifier'. Silicone indeed.

Good grief, it's a wonder there aren't valves in there somewhere!!

My first on-air run was a disappointment for two reasons. One, the battery was missing. Two, the pinout didn't match my Icom.

A visit to the supermarket battery counter and a soldering session in the cable connector department of my shack solved both problems — and I was finally on air with that authentic crystal sound. I needed to adjust the volume control underneath a little, but I was rewarded with reports of very good audio. What more could you ask?

*(From my end, the audio was quite amazing, particularly at the top end of the range. Such clarity! I have rarely heard such bell-like quality at the higher frequencies. Ed.)*

I guess I would heed the warning on the instruction sheet though. Don't get the thing heated over 45 degrees C or else it will kill the crystal. Also, don't turn the volume up too high lest you earn reports of a tinny sound or a squeal when transmitting.

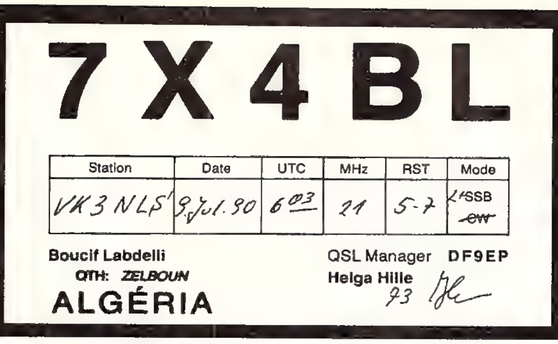
Is it worth the $249 and all the desk space? Well, as far as the on air sound goes, the Astatic D104 is very good value indeed, but let's face it — this is a microphone designed to enhance image. Who cares about the sound?! One more thing — for any younger readers, be respectful to the dear old thing. After all, these very microphones graced the pages of wireless journals from the very earliest days of voice modulation, and were found in the very *best* of radio shacks...

R&C thanks Enhanced Radio Communications for the loan of the review microphone.

## UPDATING ALL THE DX

Compiled by Len Shaw, VK3ALS

email to shawlen@werple.mira.net.au



# 7 X 4 B L

| Station | Date | UTC | MHz | RST | Mode |
|---|---|---|---|---|---|
| VK3NLS | 9.Jul.90 | 603 | 21 | 5-7 | ✓SSB<br>~~CW~~ |

Boucif Labdelli
QTH: ZELBOUN
ALGÉRIA

QSL Manager DF9EP
Helga Hille
73

### 4U/TF1MM not in Syria

Thor, TF1MM, is currently active as 4U/TF1MM and is operating from the Administrative HQ of UNOMIG (United Nations Observer Mission In Georgia) in Pitsunda, Abkhazia, Georgia. He reports there is no government there to apply for a reciprocal licence, so the only possibility is to operate under the umbrella of the UN. This location counts as 4L (Georgia). Thor suggests, "Please QSL only to the TF-Buro — *not* direct to my home call. The callbook address is no longer valid." He will QSL all contacts via the bureau. By the way, he is looking for a QSL Manager.

### 7P8L, Lesotho

South African operators Dave, ZS6RVG; Richard, ZS6CAL; Leroy, ZS6XJ and Mark, ZS6HZ will leave Johannesburg on January 22, 1998, to travel to a Chalet site at the top of the Sani Pass within the Kingdom of Lesotho.

Lesotho is a land-locked kingdom, totally enclosed within the boundaries of the South African Republic. This is an almost totally mountainous nation and is known as *The Roof of Africa*. The Sani Pass at 2,873 metres (9,425ft) is one of the highest mountain passes in Southern Africa. The highest public house in Africa is, by pure chance, situated at the top of this scenic pass.

The ZS6 group's main objective is to establish at the top of the Sani Pass, a mobile amateur radio station for the express purpose of providing SSTV and RTTY communications on the amateur radio bands 2, 10, 15 and 20 metres.

Communication on SSB and CW modes will depend on conditions on site at the time. This is an SSTV and RTTY DXpedition first and foremost. They plan to start setting up the radio site around their Land Rover as soon as they arrive. They may get to operate late Thursday night if all goes well. If not, the operation will be active Friday, January 23 through Sunday, January 25, 1998.

Operators will use their home call /7P8. They plan to be active for a full three days and band conditions and WX are to determine time and modes of operation. Break down of the radio site, clean up, and return to Johannesburg will take place on the 26th. QSL to ZS6RVG via the ZS bureau, or direct to 1997 CBA: Dave Plaskett, PO Box 8116, Edleen 1625, Republic of South Africa.

### 9N, Nepal

Charles, K4VUD, reports that he is planning to go back to Nepal again. This time it will be during February/March, 1998. He will stay in Kathmandu. He has mentioned that if anyone wants to donate any radio equipment to 9N1AA or 9N1HA, the only two native Nepal hams there today, he is willing to carry it in his baggage. Satish, 9N1AA, has a new house with a real permanent amateur installation planned there, but cannot receive a beam because of import restrictions. He wants to get on RTTY and on satellites but has no TNC and no two metre SSB gear. Serious donors, please phone Charles at 0011 1 407 349 2211.

### FR5, Reunion

Oliver, ex-FR5HG, is now active with his new callsign FR5CC. Oliver told OPDX that he works a lot of US stations on 10 and 15 metres around 1800z. Looking at the cluster spots, check between 1230 and 1800z around 21,005, 21,220, 28,480 and 28,495 kHz. QSL via FR5CC, Olivier DIJOUX, 40, route Gabriel Mace, 97490 Sainte-Clotilde, Reunion Island.

### QSL info and news...

- Siso, HK3SGP, states to QSL HK3MCM via HK3SGP: Francisco 'Siso' Hennessey, PO Box 170030, Bogota, Colombia SA. He can also be reached at the following E-mail addresses: **hk3sgp@qsl.net**, **hk3sgp@impsat.net.co** or **hk3sgp@colomsat.net.co**
- Ron, AC7DX, reports he is currently the QSL Manager for AH8A, and it seems that many cards are going to W6OSP by mistake. Ron has not been able to find out where this wrong information appears. So please, anyone that might run across its posting somewhere, please let Ron know by direct E-mail so that he can try to correct it. E-mail address is: **ronlago@efn.org**. Snail mail address is: Ron Lago, PO Box 25426, Eugene, Oregon 97402, USA

### Special event

Hector, LU6UO, and Ernesto (Ernie), LU4AXV, will activate Deception Island base amateur station LU1ZC with the support of the Argentine Antarctic Management Agency — DNA — and the Navy Amateur Auxiliary Service — SARA — in celebration of the 50th anniversary of the base. They left Buenos Aires on December 8 in an Hercules C130, and flew to Argentine Antarctic Marambio base, located in Seymour Island, then transferred to the Argentine ice breaker 'A Irizar'. They hit the air as LU1ZC on December 15 and plan to remain there until the end of February. Operation will be mainly on CW but some SSB. QSL with some IRCs to LU6EF/GACW address (listed in the DX & Band column).

# WIN AN ICOM IC-40S!

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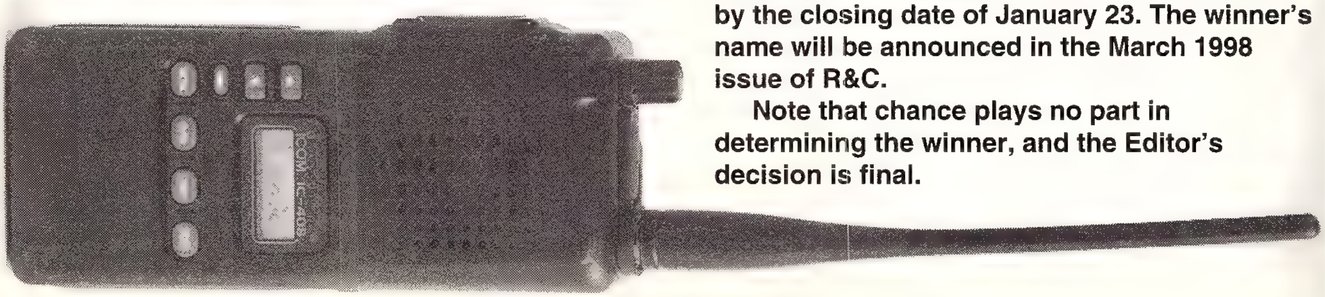
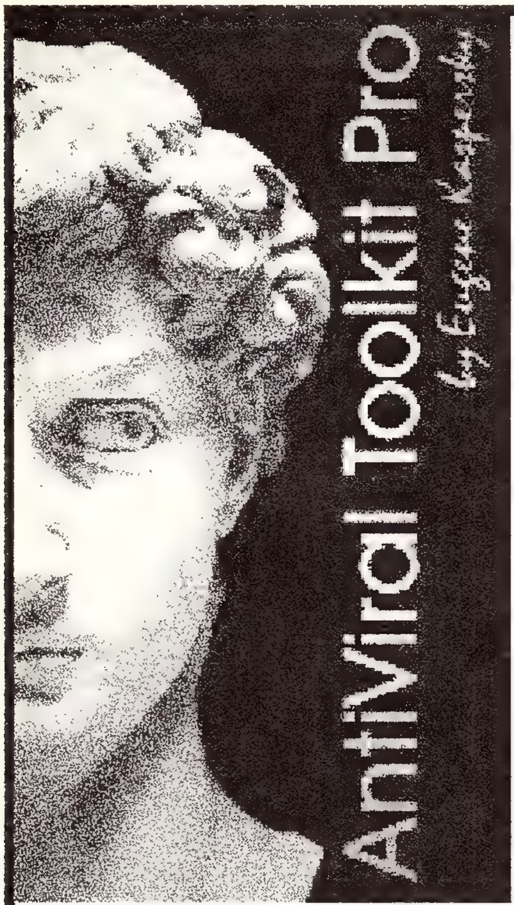
**Note that chance plays no part in determining the winner, and the Editor's decision is final.**





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# The Maxi Audio Filter

By Harold Hepburn, VK3AFQ

Of recent years receiver constructional articles in the amateur press have tended to concentrate on the direct conversion (DC) approach.

In the main, these articles have extolled the undoubted virtues of circuit simplicity, ease of construction and low cost. This approach no doubt has enabled new or intending amateurs to get their feet wet with a minimum outlay in time and money. However, this emphasis has the drawback that the DC receiver may tend to get looked upon as some sort of second-class citizen. Such a viewpoint would be quite erroneous as a DC receiver is inherently capable of performing just as well as the more conventional superhet. It could well be argued that, had there originally been the means of providing selectivity other than at an intermediate frequency, then the superhet might never have attained the predominance that it did.

The main difference between the two types of receiver is that, in a superhet, the selectivity is determined at some intermediate RF frequency (by means of tuned transformers, crystal, mechanical or other types of filter) whereas in a DC receiver — there being no intermediate frequency — selectivity must be obtained mostly in the audio spectrum.

For some while the writer has been interested in just how good a DC receiver can be designed and constructed if one does not follow the 'cheap and easy' route. Very strong RF stages and mixers have been described, most recently in the *Technical Topics* column of the September 1993 issue of the RSGB member magazine *Radcom*.

The writer has developed a wide dynamic range AGC system for use with DC receivers (something rarely included in published designs) which operates in the audio spectrum. Wide dynamic range — and linear — S-meter systems have been described using such devices as the Signetics NE604 or the National LM3089.

Until recently it was rather difficult to obtain selectivity in a DC receiver which was equivalent to that of a superhet using a crystal or mechanical filter. The 'goodness' of such filters is often quantified as the relationship between the filter bandwidth at -6dB and that at -60dB. A typical figure for this 'shape factor' is between 1.2 and 1.5. Whilst it was certainly possible to build audio filters — either bandpass or low pass — having similar shape factors, their design and adjustment was really a job for a well-equipped laboratory.

In early 1993 the Maxim company in the US brought out an eight-pin IC which offered not only a 1.2 shape factor but also the ability to adjust the -3dB rollover frequency anywhere between under 1Hz to nearly 25kHz. For amateur purposes adjustment between 500Hz and 5kHz is both simple and adequate, especially if it can be done with a single front panel control.

This article will describe a variable frequency low-pass filter using the Maxim MAX294. The makers describe this chip as an 8th order (that is an eight pole) elliptic, switched capacitor low-pass filter. The chip also includes an uncommitted op-amp which can best be used in an anti-alias role preceding the filter proper.

....☞

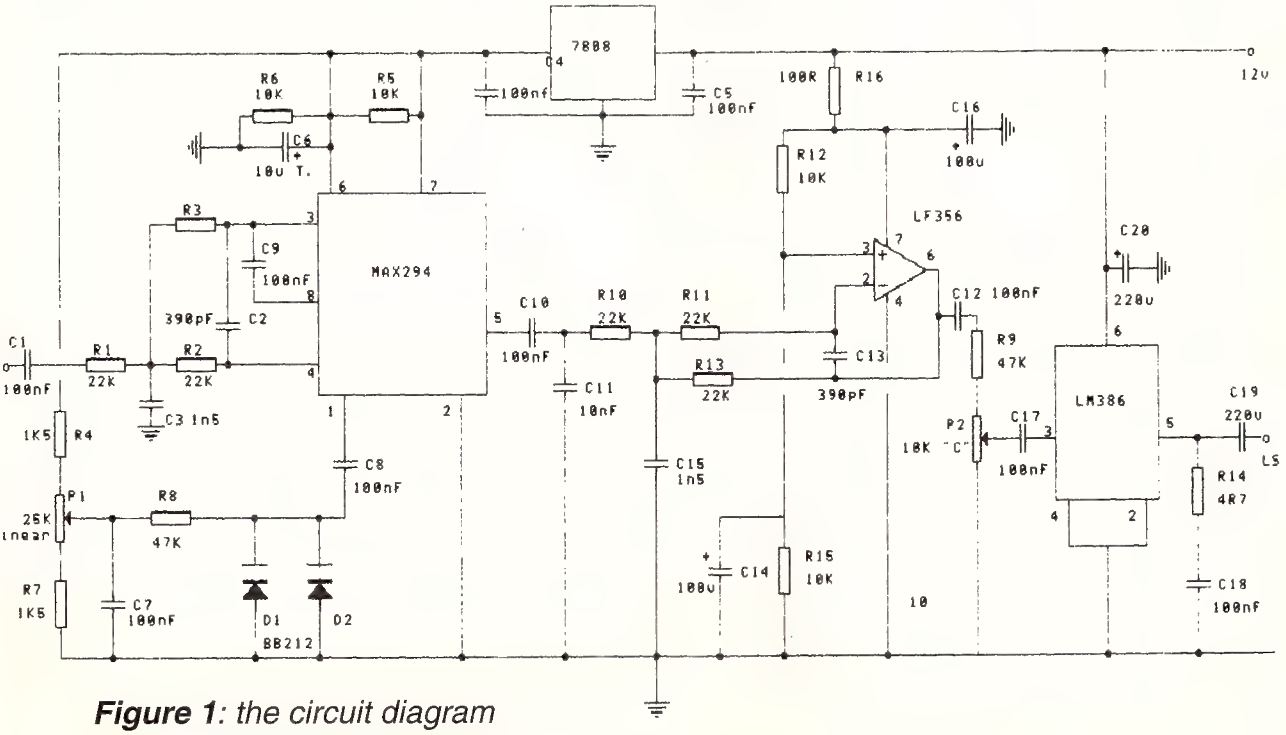
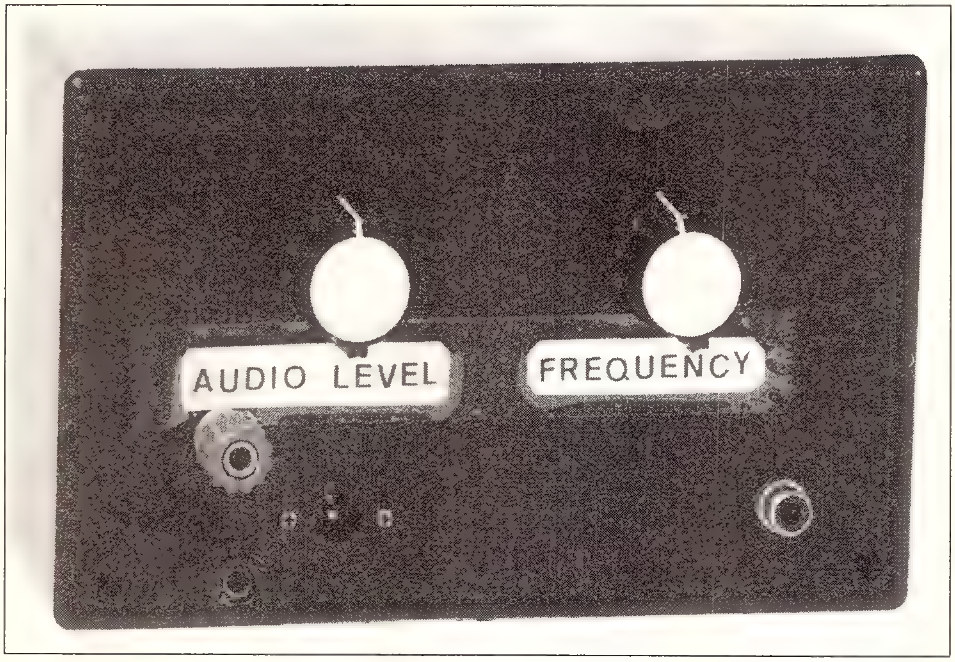


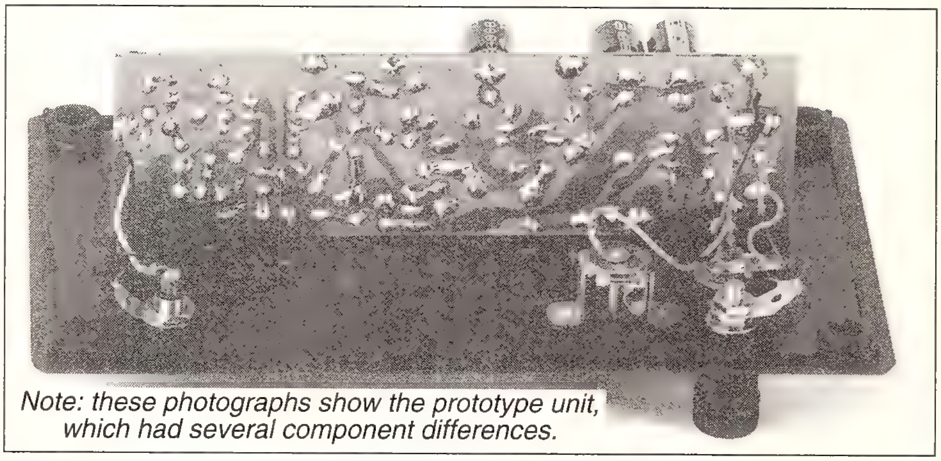
**Figure 1:** the circuit diagram



## Circuit description

**Figure 1** gives the circuit diagram of the completed filter. C1 is a DC blocking input capacitor whilst R1, R2, R3, C2 and C3 form a two-pole anti-alias circuit having a roll-off of around 10kHz and utilising the on-board op-amp between pins 3 and 4 of the MAX294. The op-amp output is capacitively coupled to the filter proper through C9.

The 8 volts from the 7808 TO220 three-terminal regulator is applied to pin 7 of the device while pin 2 is earthed. Pin 6 is held at half rail potential by means of R5 and R6 with C6 providing smoothing.


*Note: these photographs show the prototype unit, which had several component differences.*

Pin 1 of the MAX294 is the interesting pin. It can be fed with a CMOS-derived square wave clock signal at 100 times the required -3dB cut off frequency or a single capacitor from pin 1 to ground can complete an on-chip oscillator. The internal oscillator is used in this application. The relationship between the -3dB rollover frequency and the capacitor size is given by the formula:

**C (osc) in pF = 333 / f (-3dB) in kHz.**

So if it is of advantage to vary the -3dB point from, say, about 350Hz to about 5kHz then C (osc) will have to vary between 950pF and 67pF. This sort of swing could, of course, be obtained using two paralleled sections of an old broadcast tuning capacitor. A far more elegant (not to mention easier) solution is to use a voltage-tuned varactor diode. In this case the two halves of a BB212 are paralleled to give a capacity swing of approximately 1000 pF when a DC bias of between 0.5 and 7.5 volts is applied. This bias is obtained from the R4, R7, and P1 network, while R8 and C7 providing decoupling.

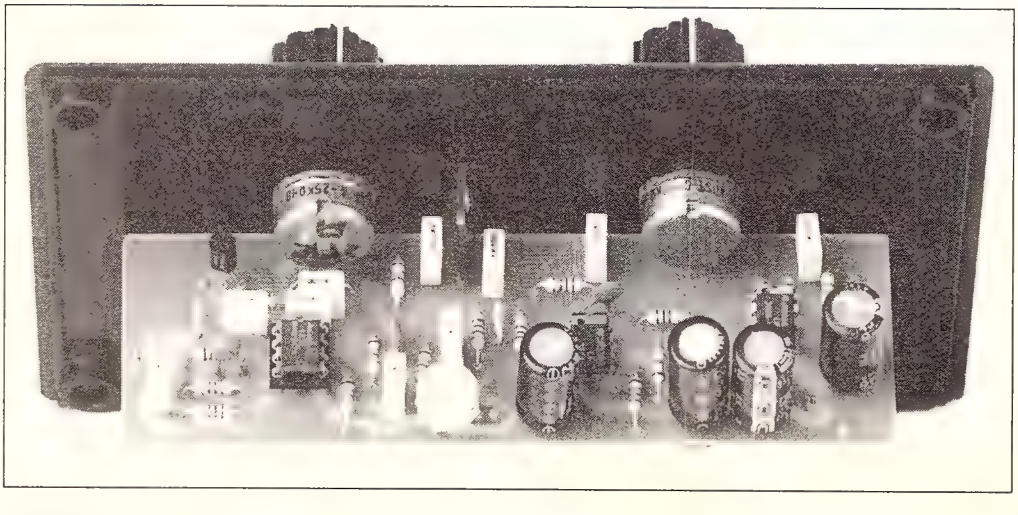
Note that these range figures are somewhat 'fuzzy' since the specification for each section of a BB212 covers a capacity range of 500 to 620pF at a bias of 0.5 volts.

In this application, this imprecision is of little consequence since the overall adjustment range of the unit is well in excess of anything that might be required in amateur service. C8 is a DC blocking capacitor and has no significant effect on the tuning range.

It has been mentioned that the internal oscillator runs at 100 times the required -3dB cut-off frequency. If the lowest cut-off is in the region of 350 Hz then the lowest oscillator frequency will be 35 kHz.

To clean up any residual oscillator feed-through, an LF356 (or CA3140) is used as another two-pole 10kHz lowpass filter.

Output from this op-amp goes to a simple LM386 audio amplifier, whose input level is controlled by the front-panel audio level potentiometer, P1.



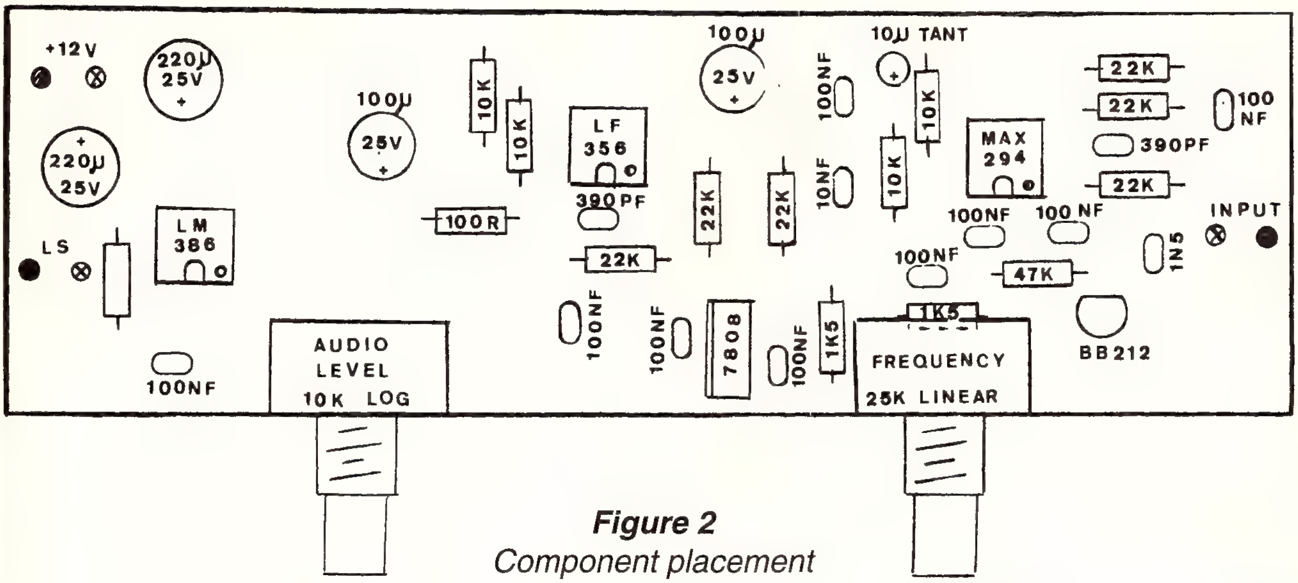


***Figure 2***

*Component placement*

The resistor R9 in series with this pot requires some comment. The MAX294 has the best possible signal-to-noise ratio when its input is between 3 and 8 volts peak to peak. Such a voltage applied to the LM386 would certainly overload it. Depending on the application and the available input voltage it may be necessary to increase the value of R9 to prevent overload. Values of up to 100K can be tried.

## Construction

**Figure 2** shows the position of the components on the 130 by 40 mm single-sided circuit board.

It is recommended that the six PCB pins be put in first. Thereafter the other components can be soldered on in any order and no particular precautions are necessary except to observe the correct polarity for the electrolytic capacitors and to ensure that the three ICs are the right way around.

The two potentiometers P1 and P2 are of the type that solder direct into the PCB. This means that the whole assembly can be attached to whatever front panel is used by means of the screwed bosses of the two pots.

The prototype unit was housed in a 155 by 95 by 52 mm plastic utility box. Audio input was via an RCA socket, the speaker output used two terminal posts, whilst a DC socket was used to input the 12 volt supply. Neither the audio level pot nor the frequency pot were calibrated, since both controls are adjusted by ear.

As a rough guide, the frequency pot gives a cut-off around 350 Hz in its most anticlockwise position, around 1.5 kHz at mid-scale and around 5 kHz when fully clockwise. If a more precise scaling is required it would have to be done for each individual unit (BB212) using an accurate audio signal generator and an AC voltmeter capable of working at at least 5 kHz.

Whilst this filter was designed with a view to its incorporation in the writer's DC receiver 'test bench' to provide crystal filter-like selectivity, it has also been used to very good effect in conjunction with commercial transceivers to give additional audio frequency filtering.

It is understood that complete kits for the variable low pass filter will be available through Daycom Communications of 44 Stafford Street, Huntingdale, Victoria 3166.

## COMPONENT LIST

**Semiconductors**

one MAX294
one LF356
one LM386 (22V)
one BB212 dual varactor diode
one 7808 TO220 voltage regulator

**Resistors**

Fixed — all 1/4 watt, 5%:

| | |
|---|---|
| R1, R2, R3, R10, R11, R13 | 22K |
| R4, R7 | 1K5 |
| R5, R6, R9, R12, R15 | 10K |
| R8 | 47K |
| R14 | 4R7 |
| R16 | 100R |

Variable — PCB-mount type:

| | |
|---|---|
| P1 | 25K linear (A) taper |
| P2 | 10K audio (C) taper |

**Capacitors**

Electrolytic:

| | |
|---|---|
| C6 | 10 mfd 16V |
| C14, C16 | 100 mfd 25V |
| C19, C20 | 220 mfd 25V |

MKT:

| | |
|---|---|
| C1,4,6,7,8,9,10,12,17,18 | 100nF |
| C11 | 10nF |

Ceramic:

| | |
|---|---|
| C2, C13 | 390pF |
| C3, C15 | 1n5 |

**Miscellaneous**

One PCB #220794
Six PCB pins
One plastic box to suit
Two knobs
One RCA input socket
One two-way speaker terminal strip
One DC input lead

# FEEDBACK

***Where you get to have your say...***

*Send your Feedback via the Internet to* **vk3ce@tbsa.com.au**
or by mail to **'Feedback', Box 1 Yarra Road, Wonga Park 3115**

## *Morse Code — or is the WIA the problem?*

*The WIA replies to Don Crago, VK5KDC*

Dear Sir,

The letter in *Feedback* from **Don Crago, VK5KDC** in the November issue raised some previously unstated points about the Morse qualification, but along the way made a number of misinformed assertions, unfortunately.

In the middle of the year, WIA Federal surveyed Division members to gauge feelings about the review of the definition and qualifications of the Amateur Service in the International Radio Regulations of the International Telecommunications Union (ITU) treaties. Among other things, an issue being addressed by the International Amateur Radio Union concerns whether the international regulations should retain the mandatory Morse Code qualification for operation below 30 MHz, or leave it up to a country's administration.

It is NOT about *abolishing* Morse Code for amateur licences around the world, a mistake so many antagonists have made.

The WIA's member survey was prompted by the fact that the matter was to be debated at the September Region 3 IARU Conference in Beijing. For the record, more than 1600 surveys were returned and the vote was 2-to-1 in favour of maintaining the Morse qualification in the International Radio Regulations.

The survey's purpose was to provide an updated assessment of opinion since publicising the IARU's initiative in establishing the Future of the Amateur Service Committee (FASC) in 1995, which raised the issues on the Amateur Service definition and qualifications in a series of discussion papers. Following that, the WIA sought comment from the Australian amateur community over a period of time. Very few amateurs took advantage of the opportunity to have a say.

Returning to Don's letter, he raised four points at the outset: *The number of candidates for examinations is dropping steadily; between 1992 and 1995 the number halved.*

True, but this is a quote out of context. Don's implied argument is that this shows fewer people want to sit for amateur exams because "...who wants Morse Code any more?". Buy an Outpost Licence and you can work HF, he says!

In October 1992, the then Minister for Communications announced new amateur licences and privileges were coming. Nothing happened until mid-1995, two Ministers, a new Radiocommunications Act and a new regulatory administration later. No wonder demand for exams plunged! In addition, after the exam system was devolved to the WIA in 1992, examination pass rates rose, so there were fewer 'repeat' candidates. With the classes and exam system stabilised around accredited examiners, students were better prepared.

*AMSAT newsletter membership has fallen to its lowest in five years.*

Does this imply a lack of interest in amateur radio because of the mandatory Morse Code requirement? It's at least equally likely that the newsletter doesn't serve the interested amateurs' needs. Likewise, competing interests may draw amateurs away (you can only do so much!).

Quoting WIA Federal Education Coordinator, Brenda Edmonds VK3KT, *"...If there are too few operators coming in, then the WIA is on the way out even if all new licensees become members..."*

Another handy quote out of context. Brenda was engaging in that argumentative device of hyperbole — exaggeration for the sake of emphasis. If the WIA got all new licensees each year, around 350-400, the *opposite* would be the case, in fact!

*Each month we read about the ageing ranks of the amateurs, and each month there are more silent keys than there are new members.*

Perhaps Don's engaging in a little hyperbole here. The published evidence suggests the opposite is the case. Don went on to make some telling points about the fascination of technology and the 'stumbling block' of Morse Code.

It's interesting to note here the report from a working group at the September IARU Region 3 Conference in Beijing which looked at the FASC discussion papers and comments on the issues from member societies at the conference. This working group was chaired by David Wardlaw, VK3ADW, the WIA's IARU Liaison Officer, with the participation of IARU Vice President and FASC Chairman, Michael Owen, VK3KI. The working group noted strong support for retention of the Morse requirement by the majority but added that there was a significant minority that favoured the elimination of the mandatory requirement and the adoption of a more flexible approach.

During a conference plenary session debate on the issue, Ms Thida Denpruektham, HS1ASC from the Radio Amateur Society of Thailand, commented that a number of countries had permitted code-free HF access to their amateurs, notably Japan and Korea, and such licence grades had introduced a very large number of people to amateur radio who had by and large adopted and carried on the true spirit of amateur radio, without detriment to the hobby.

It is clear that, while a majority of amateurs want to see Morse retained as a mandatory qualification for HF privileges below 30 MHz, the 'significant minority' (in the WIA member survey's case, some 30 per cent) who favour leaving it up to each country's administration indicates a change in attitudes is afoot. See the FASC's 'third report' at **www.iaru.org/fasc4out.html**.

Every amateur and potential amateur is a stakeholder in this issue. World wide.

*Far be it from me to say how the WIA should be run, or how it should advise the ACA — however* ***somebody*** *needs to, as it appears not to be working very well at present. I think the relevant committees should forget their personal desires and listen to those of the majority, not only the members of the WIA, of which I am a member, but* ***all*** *Australian amateurs.*

Does this mean the WIA surveying all Australian amateurs? Who would pay for the costs of mailing all 16,000? WIA members. Why should WIA members be asked to 'carry the can' when those who want a say in an issue but aren't prepared to contribute? All active amateurs, and potential amateurs with an active interest, have been provided the opportunity to comment following publicity about the FASC's work. Few have taken it up.

With all due respect, how Don Crago imputes the 'majority' view, without supporting numerical evidence, is something of a mystery. It takes a direct, immediate threat to privileges to get any great number of amateurs up in arms.

The 'relevant committees' are not pushing their personal views, but collating views widely canvassed along with results from member-funded, member surveys. The WIA is not some amorphous entity employing 'back room' committees with personal barrows to push. It is the *members* collectively who are the WIA.

Don Crago should be congratulated for his summing up: *Let's try to keep the WIA the most important body in the amateur world, not a down and out has-been.*

The first step is becoming, or remaining, a member.

Roger Harrison, VK2ZRH,
WIA Federal Media Liaison Officer

## *More repeater list woes*

Dear Sir,

I refer to the letter *Repeater List Woes* (Feedback, November 1997). I recently installed a UHF CB in my vehicle, using the listing from R&C magazine.

I decided to mark the position of all QLD UHF CB repeaters on my road maps (for quick, easy reference) then circle them with a 50km range ring.

Many sites are reasonably easy to find while others require the intuition and skills of an investigative detective.

First of all there are the geographical multiple choices. MOR01 Mt Hope, for example, presents a choice of six Mt Hopes, OWN01 Mt Oweenee two and TTH01 Twin Hills two *(well, they* ***are*** *twins...)*.

Then there is the use of 'Darling Downs'. The Darling Downs region covers a few thousand square kilometres! Emergency service providers, amateurs and sundry organisations tend to use the same hill or mountain on which to erect their comms equipment.

An old WIA magazine repeater listing coupled with intuition positions MOW04 Darling Downs at Mt Mowbullan in the Bunya Mountains, some 90km north-west of Toowoomba.

Then there are those that just cannot be found (14 of them), including one emergency channel five and five others requiring further positioning confirmation, again including one emergency channel five.

I have corresponded with Trevor Colwell of ACBRO, who pointed out that vandalism has been a problem at some sites; I acknowledge this is always a possibility. I've been requested to maintain confidentiality, by not showing others my maps, when or if I find all repeater sites. Some repeater owners don't subscribe to confidentiality, though — I know of a number of repeaters with signposted access roads!!

A quick look at the NSW CB repeater list indicates the same problems occur with that state's listing and I suspect are repeated (excuse the pun) in other state lists.

Surely *some* positioning system can be devised which indicates the area or nearby town serviced by a particular repeater (which is what I'm actually after) and which at the same time protects the site from vandals.

If this cannot be done, why publish a list of repeaters in a national magazine using site references, some of which are so obscure that I simply cannot find them at all or have difficulty with 20 per cent of them (QLD) including two emergency repeater sites using a 1:1000000 atlas and 1:250000 air navigation maps?

Colin McIntyre,
Margate, Queensland

## ...another, but different.

Dear Letters Editor,

I was a little bit surprised at Norm Lee's letter on page 85 of R&C, November... and also left wondering at your response.

From your remarks you are obviously aware that the information Norm requires is published in the Radio Amateurs Callbook, yet you did not mention this specific fact. *(Sorry. I assumed he would know that. The list attributes the material to the WIA. Ed.)* No doubt you've already had a couple of dozen letters from interested amateurs of the above fact. (Only yours

For Norm's information, the Callbook lists all the known repeaters (it doesn't go out of date all that much). It shows not only their Rx/Tx frequencies plus the nearest town, as well as their effective radiated power and their height above sea-level — very useful information when you're travelling all over the countryside as Norm and I do. The only listings that have caused me any difficulty are two in Victoria — VK3RLV in the Latrobe Valley on Mt Tassie, wherever that is, and VK3RDU in the Goulburn Valley. Both rivers run for quite a few miles!

I don't know how many travellers like us have GPS position receivers, but I would suggest to such people that they are an invaluable aid when travelling. Dick Smith puts out the very handy little book *Australian GPS Location Guide*. I am hoping that in the not too distant future he will add the latitude and longitude of the country's two metre and 70cm repeaters, or issue an additional book.

With the aid of your GPS receiver you can readily work out (knowing the position of the repeater) its distance and bearing (true or magnetic), and from the callbook its output power and altitude.

Gordon Brown, VK1AD
Manuka, ACT

Thanks for your letters, Colin and Gordon. As you can see, we have some clear problems with *both* repeater lists. We have been aware of some... shall we say, *limitations*, of both of these lists for quite some time.

The problem is that people who live in, say, the ACT, don't often refer to their local repeater lists. They know where the local repeaters are to be found, so why consult a list?!!

The CB information is periodically updated for us by the ACBRO folk. Their information relies on repeater operators and users getting in touch with them to advise changes or variations to the list. The amateur information was supplied to us by the WIA some two years ago, and since then we have updated the lists every time a local operator passed on new information (thanks!).

The WIA contacted us a few months ago to say that a completely new list was being prepared, but we couldn't get a copy of it until the new callbook was published. (That has now happened, by the way. We received a copy a couple of weeks ago for review.)

Frankly, we cannot see any way to get information about changes to either list without a good deal of reader assistance. How on earth would we know which repeater is which in Darwin, for example? We're in Melbourne...

We've limited each listing to a geographical location or nearest town simply to save space. The full listing of amateur repeaters, as published in the callbook, runs to several pages. We simply cannot devote six, eight or ten pages each month to something repetitive like a repeater listing. It's quite out of the question. But we would be the first to agree that the information should be far more accurate. Can we rely on our readers to pass on updated information for their area, or should be drop these listings altogether?

Both of our writers this month wanted more information about each repeater. Both suggested we supply far more accurate data. Fine. Now tell me: how long do you want the repeaters to stay in commission? Vandalism or theft is always a prime consideration in any repeater operator's choice of site. Even the decision whether to install in the first place or not may be based on the possibility that the site may be visited by twits who simply do not think. Dick Smith's book was reviewed here about a year ago, and I still find it a very valuable resource. But publish a GPS coordinate for every repeater? No way!

However, for Gordon's benefit, personal knowledge (and work on the site about 20 years ago) tells me that Mount Tassie is 18 miles (whatever that is in Hectocubits!!) south of Traralgon, in Gippsland. We even had to paint VK3RLV's coax in alternating red and white when we ran it up the TV station's mast! I recall the view from half-way up the mast was really quite spectacular, particularly to the east, which was virtually uninterrupted...

And VK3RDU isn't all that far from Euroa on the Hume Highway. But as for *exactly* where, and on *exactly* which hill, I think its operator would rather we didn't say.

That's the point, isn't it? We all know our local repeaters, but stick me in outback WA or somewhere and I wouldn't have a clue. I'd be reaching for a repeater list in R&C — and praying that the information was right.

What do *you* think? Should we drop the repeater lists altogether? Will *you* help bring our data up to date? Email either way to vk3ce@tbsa.com.au or just write to me at Feedback, Box 1 Yarra Road, Wonga Park, Vic 3115

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# Propagation foreca

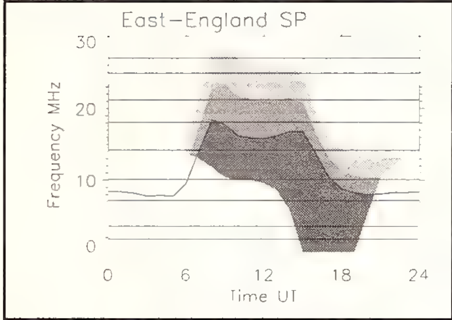
## ABOUT THESE CHARTS

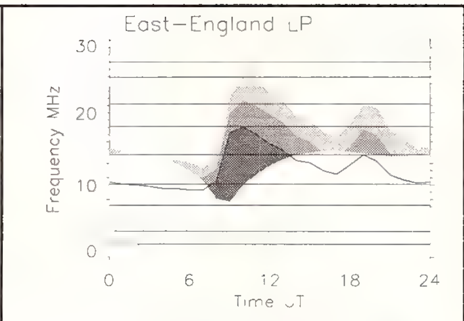
The data on these pages are graphs showing forecasts for expected HF operating conditions between Australia and a number of important DX destinations. The information they contain is prepared by **IPS Radio and Space Services**, a division of the federal Department of Administration Services. IPS monitors changing radio conditions — which are affected most greatly by fairly predictable changes in solar activity — and issues reports and warnings based on that data.

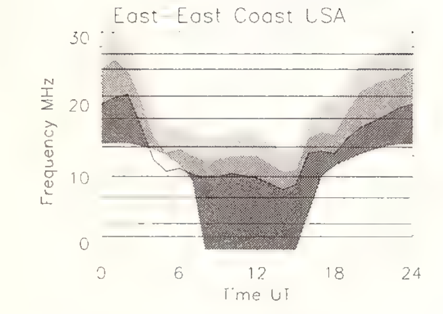
Stations in the eastern half of Australia should refer to graphs on the left hand page. The data on the right hand page is calculated for stations in the western half of the continent. Of course, if your location is in the middle of the continent try reading them *both*... then make an educated guess.

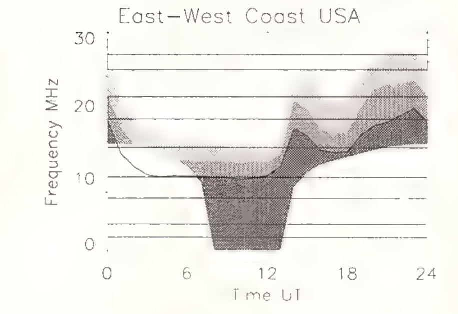
The horizontal axis of each graph represents the hour of the day expressed in Universal Co-ordinated Time or UTC ('z'). The vertical axis shows the entire HF spectrum with a horizontal line representing each HF amateur band.

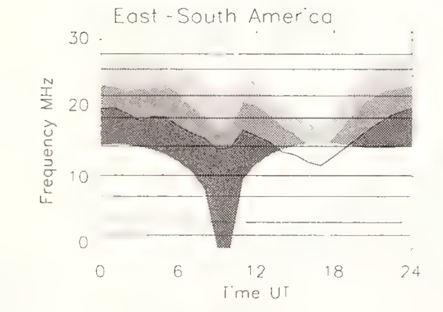
The maps are easy to read. First go to the map which looks closest to the area in which you are interested. Look *up* from the time and *across* from the frequency to the point at which the two variables merge. Note which grey scale — if any — appears at the intersection of the particular time and frequency combination for that area and refer to the legend (right) to find the sort of propagation most likely to apply. If the space is blank the forecast is not good — your time and frequency combination is unlikely to allow communication to the destination station.

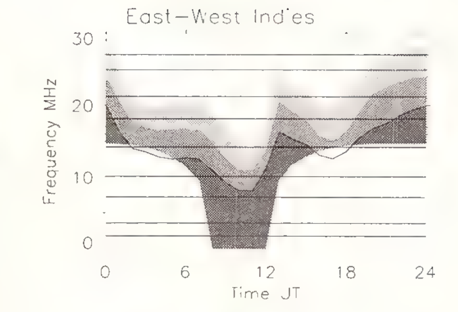


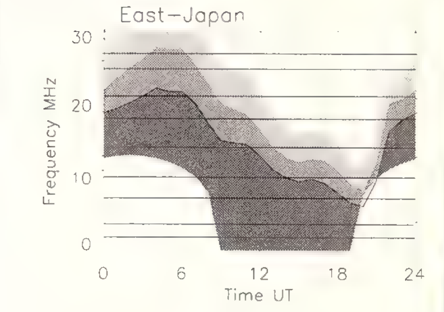


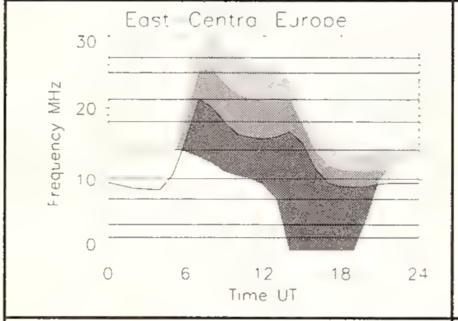


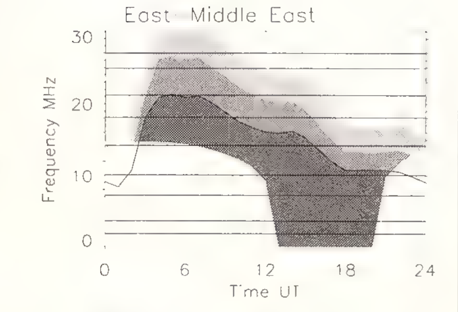


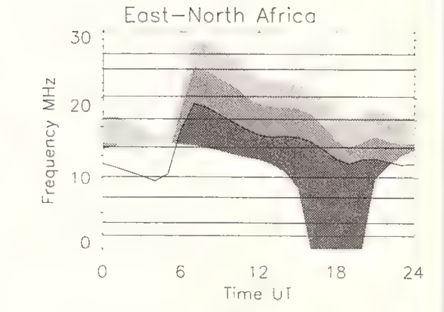


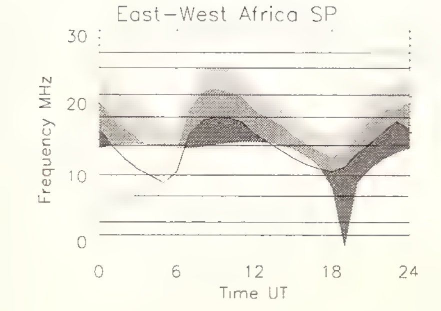


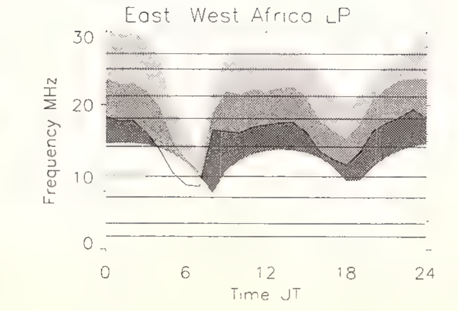


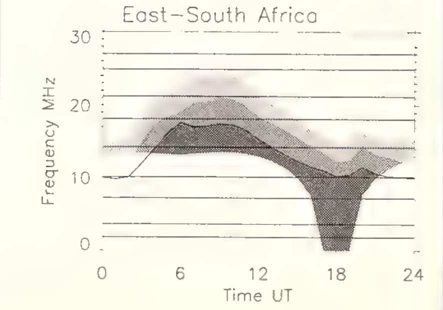








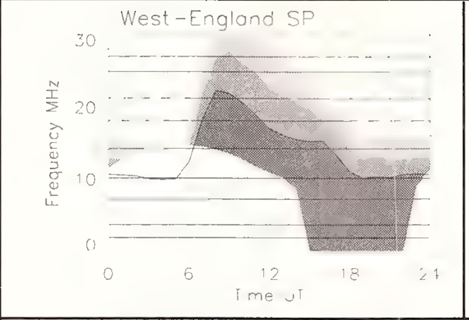




# er Jan 1998

**LEGEND**

| | |
|---|---|
| **UD** | Upper Decile — You have a 10% chance of getting through. |
| **MUF** | Maximum Usable Frequency. 50% chance to get through. |
| **OWF** | Optimum Working Frequency. 90% chance of a contact. |
| **EMU** | E-layer Maximum Working Frequency. |
| **ALF** | Absorption Limiting Frequency. Lower limit of the usable band. |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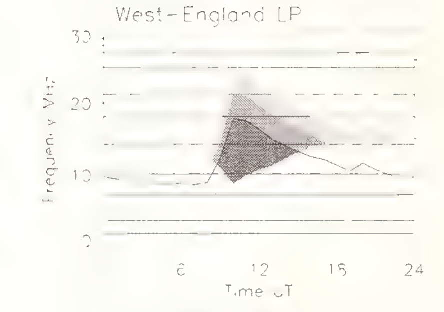
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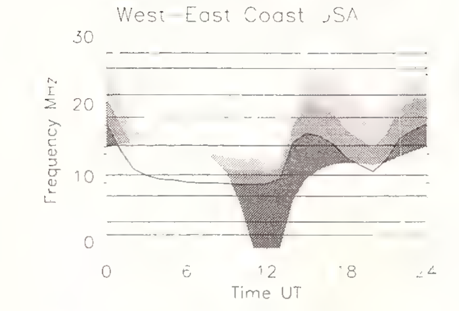
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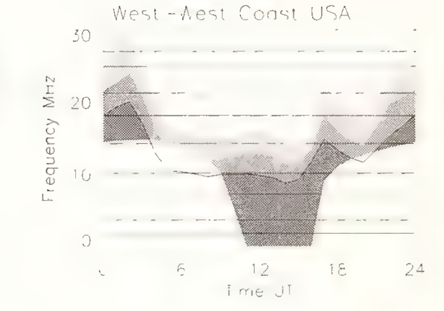
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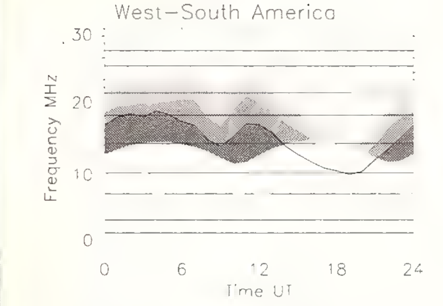
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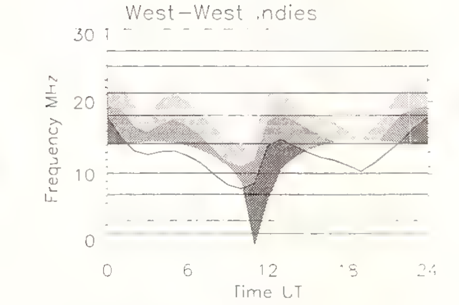
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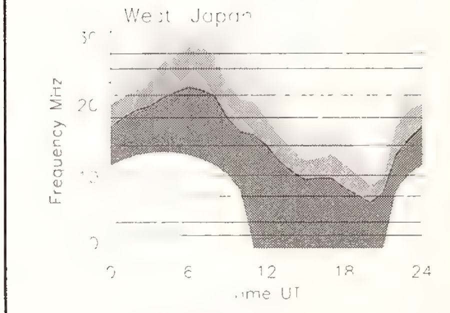
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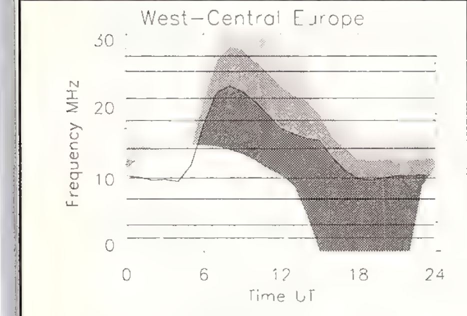
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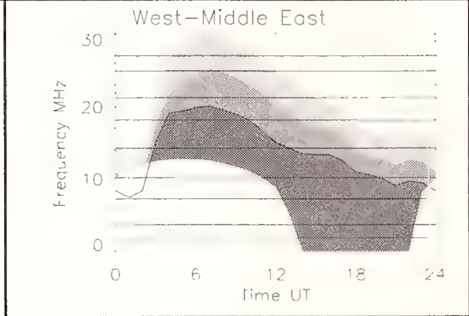
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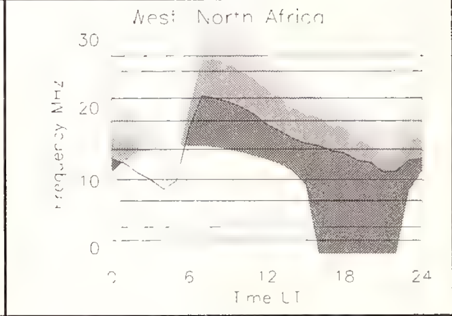
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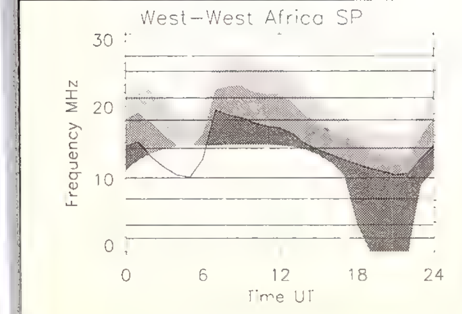
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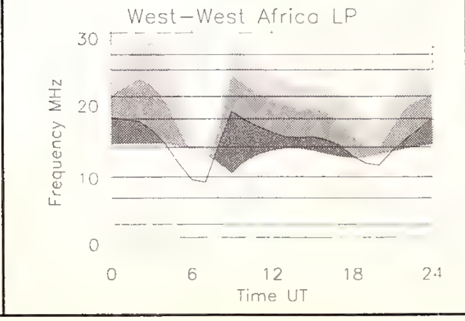
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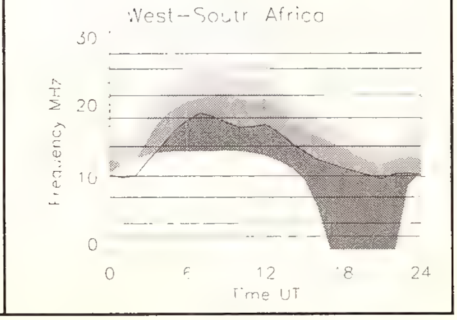
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WIRELESS INSTITUTE OF AUSTRALIA

# WIA Update

Does the WIA really achieve much for amateurs? It's a fair question. There are amateurs who believe that our frequency bands, licence privileges and conditions are doled out, or taken away, at the whim of the regulators while the WIA trails along behind like a puppy happy for a few scraps. Some believe that the WIA accepted the huge hike in licence fees proposed for 1995 and that the backdown by the Labor government only happened because of the barrage of protests from amateurs.

The recent lowering of beacon and repeater licence application fees and renewals, most amateurs concede, was an achievement attributable to action taken by the WIA. But that's only one thing, has there really been much else? Collective memory is pretty foggy, it seems, so time perhaps for a reminder.

## Accelerated change

In the 50 years since amateurs privileges were returned after the end of World War II, the decade to 1996 saw the greatest number and scale of changes of any time in the 40 preceding years. In the years 1985 to 1995, Australian amateurs gained five new bands, two existing bands were widened, access to the DX end of six metres was returned and later widened, new amateur licence types were created, Novices got an increase in power from 30W to 100W, the number of permitted modes on HF leapt from 28 in to 40 (42 on 10m), and *any* modulation mode was allowed on bands above 420 MHz (provided you keep the bandwidth within the band you're using).

While there was continuous demand for development and deregulation in amateur radio following World War II, the gains made were largely incremental — generally small ones, gained one step at a time. Perhaps the biggest gains before the 1980s to '90s were the introduction of the Limited licence in the 1950s and the Novice in the mid-'70s.

The creation of the Novice licence came as a result of the long-term promotion by the late Rex Black, VK2YA who, in conjunction with Keith Howard, VK2AKX, spent massive time and effort in the foundation and nurturing of the WIA-sponsored Youth Radio Scheme from the early-'60s.

During the decade from 1985 to 1995, five new EHF bands were added to the existing 20 bands, and two bands were expanded — 6m and 9cm. While the EHF bands were allocated as a result of a decision of the 1979 World Administrative Radio Conference (WARC-79), they weren't released by the Australian regulators until after 1985 following representations made by the WIA, which had, in any case, participated in the world amateur preparations to, and at, that conference.

The loss of access to 50-52 MHz in the 1960s was a blow to VHF enthusiasts, with the introduction of television Channel 0 in the muddled revamp of the already-botched VHF television channel plan of the mid-'50s. It took a long time before some access was later permitted following continuous pressure on bureaucrats as administrations changed over the years.

With the coming of solar Cycle 22, renewed representation from the WIA saw access to 50-50.2 MHz in the worldwide 50 MHz allocation returned in 1991, with regional limitations in Channel 0 service areas. Further WIA representations resulted in that being further expanded by 100 kHz in 1995, well in time for the action now beginning with the rise of solar Cycle 23.

While the Radiocommunications Act of 1983 replaced the ancient (1914!) Wireless Telegraphy Act, there was little direct benefit for amateurs to come out of it. Then... It did formalise, however, that radio user licence fees were a tax. But the new act prompted a review of the administration of radiofrequency spectrum in Australia in the mid-1980s.

In 1985, Victorian Division WIA President, Jim Linton VK3PC, and this writer authored a paper on *Amateur Radio, Future Direction* published simultaneously in the forerunner to this journal, *Amateur Radio Action*, and the WIA's *Amateur Radio* magazine. It raised the demand for change in the amateur licence structure and conditions, sparking a debate among the amateur radio fraternity which continued into the early 1990s.

The 'Linton/Harrison' paper, as it became known, highlighted developments in electronics, personal computing and communications which were then beginning to have some impact on amateur radio, developments which were forecast to grow and increasingly influence the hobby. The paper threw a spotlight on perceptions of the hobby held by those outside amateur radio and suggested restructuring of the licence system to provide more entry points.

Enhancement of the Novice licence by adding access to 2m and 70cm and permitting data communications, was proposed. Two 'code-free' licences were proposed. First was a basic 'Telephony Beginners' licence, providing voice operation on 70cm after passing a theory exam more elementary than the Novice, and the obligatory regulations paper. The other was called an 'Intermediate Digital' licence, to attract computer enthusiasts new to radio communications, and graded to fit between the Telephony Beginners and the enhanced Novice licences, but without HF privileges.

Novices gained access to 2m in late 1986, then 70cm and use of data modes in 1995. The new Intermediate licence introduced by the SMA in 1995 replaced the old Combined (Novice/Limited) licence, with enhanced privileges. The new Novice Limited licence introduced in 1995 echoes the Linton/Harrison paper's Intermediate Digital licence concept.

The paper also called for removal of the 'defined mode' restrictions for Full and Limited licensees, '...to permit experimental freedom with new transmission modes...". This came to pass with the licence changes of 1995.

The paper undoubtedly had its influence, because the regulators began a thorough review of amateur radio privileges and conditions from 1989, only three years after publication, while the debate was still fresh. The devolvement of examinations, and the 1995 licence system changes, flowed from that review, a process in which the WIA was closely and continuously involved. While *all* Australian amateurs have benefited, WIA members carried all the necessary costs.

And this brings us to 'the great fees debacle' (as put by protagonists). Without the WIA widely publicising the proposed fees hike through all its channels (AR magazine, broadcasts, packet radio), and successfully putting amateurs' opposition into the public arena through wide publicity in newspapers, television and radio, thus generating a barrage of protests to parliamentarians, lobbying would not have been as effective. Without the Federal WIA's ability to collate the argument for more equitable fees and present it to the Communications Minister's Parliamentary Secretary, Paul Elliott, where would we all be now?

The costs of the campaign and travelling to put the amateurs' case to Mr Elliott were borne by the WIA, out of members' money.

## A new threat looms?

The 70cm band is being eyed-off by the *Radio Site Owners and Users Association* (RSOUA), a lobbying body of 23-24 organisations which run land mobile VHF-UHF sites and trunked radio networks.

The RSOUA's November newsletter suggested that members who believed the 380-400 MHz and 420-450 MHz bands "...may get the go-ahead from its present users and the ACA..." for spectrum licensing should launch a major lobbying effort.

"...Most of these bands are used by the Defence Department (DoD), which is known to be a tenacious holder," the newsletter said, adding that some is held for CB and amateur radio use. While they were off the mark with CB (which has 476-477 MHz), amateurs share 420-450 MHz with radiolocation as the prime service, largely used by defence. However, 420-430 and 440-450 MHz also have fixed and mobile as secondary services, again, licensed by the defence forces.

The RSOUA newsletter noted that "...Amateurs maintain very effective lobbying. They recently gained a reduction in fees shortly after new fee structures were mooted...", giving clear recognition to the WIA's licence fee campaign effectiveness.

Is the WIA doing anything about it? You bet. Who's going to carry the cost? WIA members.

The RSOUA is represented on the Radiocommunications Consultative Council (RCC), which represents radio users' interests to the ACA. So is the WIA. Who carries the cost of sending Dr David Wardlaw, VK3ADW, to RCC meetings? WIA members do.

Defending 70cm is going to take some effort in lobbying WIA defence department contacts on the RCC, as well as other organisations, to gain support for retention of access.

It is a curious fact that, over the decades when there was continuous demand for amateur privileges, WIA membership grew steadily, along with the amateur population. But during the period when the greatest gains in privileges began to emerge, membership has declined. Is it a case of 'now we've got all that, we don't have to worry'?

Now those gains have to be vigorously defended. The threat to 70cm won't be the last menace to emerge. Effective defence needs numerical support. Many want 'their say' in the future of the hobby, but there's only one way to ensure it. Join a Division of the WIA. A lone amateur writing to his local member achieves little, except for some self-comfort. But the regulators and the government only take heed of recognised, representative, member organisations. As an individual, you do more by belonging than 'protesting from the sidelines'.

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Readers of **RADIO and COMMUNICATIONS** may use the **CLASSIFIEDS** column to the extent of 25 words absolutely free! This offer applies only to private 'For Sale' or 'Wanted' classified listings, and to computers, software or computer peripherals and other hobby communications equipment — scanners, amateur or CB transceivers, etc.

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Advertisements for **commercial goods** or services will not be accepted for publication in these classifieds pages. This classified section is for **private sales/purchases** only. **E-mail submissions are preferred.**

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Readers should note that all advertisements are required to comply with the provisions of the Victorian Consumer Affairs Act of 1972. They should be aware that, under the above Act, Post Office box numbers can be published **only if the full name and residential address** of the box holder is supplied with the advertising material.

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*February issue deadline: 9 January, 1998*

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## VK2 AREA

- **Icom** IC-02AT 2M FM HT, with BC-35 NiCd chrgr, two IC-BP7 & two IC-BP5 NiCd packs, Icom spkr/mic, 5/8 telesc ant, IC-MB16 mob brkt, the lot $400. **Icom** AG-25 masthead preamp, suit IC-271/275/820/821 $50. Ant graph mon 100-1000MHz $80. Don, VK2EYI (02) 9838 1223. Transmitting gear sold to licensed amateurs only.
- **Icom** IC-725 HF xcvr with svce and owners manuals, mobile bracket, mic cables. FM board fitted. $800 ono. Mick, VK2BH (02) 6654 3195. Licensed amateurs only.
- **Icom** IC-735 HF xcvr with AT-750 matching auto ATU (4 ant outputs) incl all manuals. Never used. $1700. Marc (02) 9918 9582
- **Kenwood** TS-430S HF xcvr with both manuals. Recently o'hauled by Kenwood. With DC pwr cable. Estate of Arthur, VK2FFH. $850 + freight / post. John, VK2FUR (02) 4625 1812. Licensed amateurs only.
- **Kenwood** TS-520S HF xcvr with spare finals, hnbks, VGC $300. Mick, VK2VX (02) 9452 1652. Licensed amateurs only.
- **Maldol** HS-620 50 / 144 MHz duplexer. Brand new, never used, with instructions $65ono. Mark, VK2HMW ph/fax (02) 9971 0993 or mark@hydra.com.au
- **Philips** FM-92L VHF highband & lots of mixed old VHF crystal gear. Greg (02) 6383 9201
- **Shack Clearance**: Pwr supps, new, 5&40A; 10/15 dual 4-el beam; TH-4 10/15/20 beam; STC hiband xcvr; Willis UHF xcvr; many others. Ian, VK2AVS (02) 6672 2462
- **Tower** 18m with rotator, TH-6DXX 6-el triband Yagi, guys, cable. The lot $900. Dismantled in Sydney. Ted, VK2EZQ 019 46 0437, 1900 to 2100k only or leave message.
- **Wanted**: 9MHz SSB Xtal filt, pref 2.4kHz wide, with matching carrier crystals. Will pay reas price. Harry, VK2DD (02) 4997 1500
- **Wanted**: Australian Morse keys, esp auto-Morse, vertical pendographs, simplex autos & PMG keys. Pay top dollar for GC keys. Steve, VK2SPS (02) 9999 2933
- **Wanted**: CRT rejuvinator, 3 gun type, any cond, and any other TV svce eqpt for fledgling TV tech. Robert, VK2TAX (02) 6672 1561 B/H, (02) 6672 7575 A/H
- **Wanted**: HF ATU, universal transmatch eg Emtron EAT-1000A, MFJ948, 949, 962, 969 or sim heavy duty 1.8-30MHz tuner. John, VK2ESE (02) 6679 1554
- **Wanted**: Yaesu FC-301 ATU and YD-148 desk mic, both in GWO. John, (02) 4982 4714
- **Yaesu** FT-102 HF allmode, all band HF xcvr with owners/service manuals, mint cond, plus **MFJ**-0969 roller inductor ATU, new $1000. Tony (02) 9319 0184. Transmitting gear sold to lic amateurs only.
- **Yaesu** FT-107 HF xcvr with ext VFO $950. **Yaesu** FT-757GX HF xcvr $900. **Yaesu** FT-470 dual-band HT $400. **Yaesu** FT-2311 10W 23cm FM xcvr $520. **Yaesu** FT-690R MkII 6M allmode portable xcvr $480. **Yaesu** FT-23R 2M basic HT $260. **Icom** IC-2320 dual-band mobile $565. **Icom** IC-24AT dual-band (one at a time) HT $460. Luigi, VK2TLL 041 224 2130. Licensed amateurs only.
- **Yaesu** FT-290R 2m allmode port xcvr $350. **Yaesu** FT-212RH 2m 50W FM xcvr $350. **Revex** W-502 SWR/power meter $125. **Yaesu** FP-4 13.8V DC pwr supp $90. **Dick Smith** M-9545 13.8V supply $75. Deceased Estate of Bob, VK2HF. Rosemary, (02) 9638 4924. Transmitting gear sold to licensed amateurs only.
- **Yaesu** FT-7 HF xcvr with Ten-tec ATU, pwr supp, Morse key & SWR bridge. $400 the lot. David, VK2BDT (02) 4821 5036. Licensed amateurs only.
- **Yaesu** FV-901DM ext VFO, boxed, EC $300 ono. **Icom** IC-2GAT 7W 2M FM HT, boxed, mint cond, $400 ono. **Kenwood** AT-230 tuner, boxed, GC $260. **MFJ**-1700B ant switch, boxed, mind cond $95. **Motorola** heavy duty leather HT case $25. **Icom** LC-40 HT case $12. Steve, VK2SPS (02) 9999 2933. Transmitting gear sold to licensed amateurs only.
- **Antenna** Werner Wulf 3-el 15m $50, **Emtron** EPS-30 pwr supp, 13.8V 30A short circ prot, over-volt prot, temp prot. Kiyo (03) 9568 3315

## VK3 AREA

- **Icom** IC-229 2M FM xcvr. 50W out, wide rcve. EC, virtually new, unmodded. Not been used for ages. Great on packet!! $330. Len, VK3ALS, ph/fax (03) 9775 2575 B/H or email shawlen @mira.net. Licensed amateurs only.
- **Icom** IC-275A 2m allmode base xcvr $1200. **Icom** IC-475A 70cm allmode base xcvr $1650. **Icom** IC-25A 2m FM mobile $150. **Bird** 4381 RF Power Analyst $700. Adam, VK3ALM 015 36 2799 or (03) 9794 7873. Transmitting gear sold to licensed amateurs only.
- **Icom** IC-275H 2m and IC-475H 70cm matching 100W all-mode xcvrs, with IC-CT16 satellite interface, IC-AG25 and IC-AG35 masthead preamps for the above, all in EC, all together, $3300. Ian, VK3TAH 018 99 7199. Licensed amateurs only.
- **Icom** IC-706 HF+6+2M xcvr, with op & svce manuals, mint cond $1700. **Icom** IC-W21A dual-band HT with case, AD25 charge adapter, BP130 AA pack, EC $450 ono. Peter, VK3KAI 019 38 8044. Lic amateurs only.
- **Icom** IC-720 xcvr with IC-PS15 pwer supp, IC-SP3 ext spkr, all EC $900. Will not sep. Colin, VK3PJ (03) 5623 4926. Licensed amateurs only.

... ☞

**Please note that all phone numbers are AFTER HOURS unless otherwise noted.**

- **Icom** IC-730 HF xcvr $400. **Kenwood** TS-700SP 2m xcvr with ext VFO & set of xtals, EC $400. Damien, VK3RX (03) 5427 3121. Licensed amateurs only.
- **Icom** IC-735 HF xcvr with SM-8 desk mic, AT-150 auto ATU, PS-15 pwr supp. Mint cond, see wkg, won't sep $1550. Jim, VK3CFB (03) 5332 7563. Licensed amateurs only.
- **Icom** IC-761 HF xcvr with manual $2000. **Icom** IC-781 HF xcvr with manual $4000. Brendan, VK3FXB (03) 9432 0984. Licensed amateurs only.
- **Icom** PS-15 pwr supp, 20A, VGC, with manuals $300. Paul, VK3DA (03) 5983 1771 or 041 857 4370
- **Kenwood** TM-742A 6m, 2m & 70cm incl. triplexer & triband antennae. Will sell 6m parts sep if required. Andy, VK3DTO (03) 5382 1439. Licensed amateurs only.

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## Australian Radio DX Club

The Central Coast Amateur Radio Field Day will be held on Sunday, 22 February, 1998, at the Wyong Racecourse. Gates open to the public at 8am. Heaps of parking, railway station 200 yards away.

The Australian Radio DX Club will, as usual, have a stand, showing the working displays of valve radio receivers of yesteryear, shortwave and medium wave SWLers and DXers. Also an empty trailer will be available, for donations of equipment or $$$ for your boatanchor receivers of yesteryear, working or not. See John Wright (Johno). Free handouts of info avil & much more.

For info call (02) 9525 8901 or email dxer@fl.net.au

- **Standard** all-mode 2M xcvr, complete $400. Peter, VK3BK (03) 9879 1896. Licensed amateurs only.
- **Subaru** generator 250VAC, 12VDC, as new, rated output 240VAC/550W, 12V8.3A, 18.5kg, very quiet, ideal for outback, caravan, home, amateur radio. Only run 90hrs $650 ono. VK3DND (02) 5153 0717
- **Wanted**: Comms rx eg Yaesu FRG-7 or Kenwood R600 or R1000 & ATU eg MFJ-901 or sim. If licensed amateur, will swap Yaesu FT-7 xcvr with FL-110 linear amp, Daiwa SW-210A SWR & power meter. Ted (03) 5859 6258
- **Wanted**: Icom ant tuner, IC-2KL linear & Icom IC-475H. Ray, VK3JMY (03) 9338 2328
- **Wanted**: Triodes 2C39 type 7289. Roger, VK3XRS (03) 5152 1163
- **Yaesu** FT-650 12/10/6M 100W xcvr. Selectable IF bandpass & tuning steps or VFO. One of the best rigs around for 6m, mint cond $990. Bruce, VK3JWZ (03) 9459 6150. Licensed amateurs only.
- **Yaesu** FT-747GX HF xcvr $800. **Kenwood** TW-4100A dual-band mobile $500. **Kenwood** TS-130SE HF xcvr $450. **Kenwood** MC-60 mic $120. Tower 50ft free-standing $150. **Beam** 6-el 10-15m $150. **JRC** NRD-535D comms rcvr with ext spkr, as new $2000. **Kenwood** TS-180SE HF xcvr, *not* wkg $250. Ron, VK3EF (03) 5446 1886. Transmitting gear sold to licensed amateurs only.
- **Yaesu** FT-757GX HF xcvr $750. Bert, VK3DVY (03) 5221 6804. Licensed amateurs only.
- **Yaesu** FT-990 100W HF xcvr with built-in pwr supp, manual, mic, orig carton, PC $2250. John, VK3FGY (02) 6027 5288. Licensed amateurs only.

## VK4 AREA

- **DX**-5V 5-band vert. Covers 10, 15, 20, 40 & 80m. EC, good perf, with book. $120 ono. Adam, VK4HFA (07) 3209 9948
- **Kenwood** TH-79A dual-band FM HT $600. **Diamond** X-700H dual-band 9.3/13dB colinear $200. Glen, VK4UGC 041 431 8428. Transmitting gear sold to licensed amateurs only.
- **Kenwood** TS-440S/AT HF xcvr with built-in auto ATU and PS-50 HD pwr supp. Both in mint cond, hardly used, can deliver $1650. Philip, VK4YJX (07) 5546 3550. Licensed amateurs only.
- **Kenwood** TS-690S HF + 6m xcvr $1200. **Kenwood** TS-180S HF xcvr $550. **Icom** IC-2XA 70/23cm dual-band HT, with headset $325. Steve, VK4GY (07) 3893 1753 or 01963 6255 anytime.
- **Kenwood** TS-830 HF xcvr $650. **Kenwood** TS-930 HF xcvr $1100. **Kenwood** AT-230 ATU $150. **Kenwood** SP-230 spkr $70. **Yaesu** FL-2100Z linear $650. **Dick Smith** Explorer/1 70cm FM xcvr $150. Deceased estate — call about vertical aerials & books; catalogue avail. Peter, VK4APD (07) 3397 3751. Transmitting gear sold to licensed amateurs only.
- **Kenwood** TS-830S HF xcvr with AT-200 ATU, MC-50 desk mic $600. **Kenwood** TR-2600 2m HT, with mobile stand, NiCd chrgr, NiCd packs $150. **Mini**-multi triband beam $300. Ron, VK4GZ (07) 5448 4063. Transmitting gear sold to licensed amateurs only.
- **MFJ**-941E ATU, as new $150. **Pwr** supp 13.8V, 15-25A $130. Noel, VK4VJ (079) 79 2690
- **SCS** PTC-II (PacTOR2) DSP multi-mode PacTOR controller, nine mths old, no packet modems. Magic BBS TNC to fast for key-boarders. Dennis, VK4SX (07) 4151 5041 or dennis_edey@interworx.com.au
- **Wanted**: 6m linear amp. Doug, VK4KGP (07) 5486 4299, fax (07) 5486 4330
- **Wanted**: 7360 balanced modulator tube for Swan-400, plus should all HT be direct connected? Also want Uniden 2020 in GC. Paul, VK4YFF (07) 405 3370
- **Wanted**: computer grade electrolytics, min req'mnt 2200µF 400V and filter capacitors for HV, 4kV min. Peter, VK4APD (07) 3397 3751 AH
- **Wanted**: Hallicrafters HT-32A xmtr, SX-101A rcvr, WWII type A Mk3 xcvr, 3 Mk 11-B2 suitcase xcvr, Command rcvrs & xmtrs, HRO rcvr with coil boxes, WWII German & Japanese gear. Will pay top money. Ray, VK4FH, PO Box 5263, Daisy Hill QLD 4127 or (07) 3299 3819, fax (07) 3299 3821
- **Wanted**: HF linear 500-1200W with good tubes, ceramic preferred. Must be in VGC, tech clean output

## QSL Collection

QSL donations from silent key estates & generous amateur operators to the Federal WIA QSL National Collection very welcome. Please contact the Honorary Curator of the collection, Ken, VK3TL (03) 9728 5350 (no RFI). Looking for a good deal as won't use it much. VK4CZ (07) 3354 3779

- **Wanted**: Icom IC-228A or H 2m xcvr, GC. Paul, VK4ZDL (07) 3208 5036
- **Wanted**: Icom IC-475H 70cm all-mode xcvr. Glen, VK4UGC 041 431 8428
- **Yaesu** FT-77 HF xcvr $400. **Kenwood** TS-660 6M xcvr $475. **Standard** C528 dual-band HT $395. **Baycom** modem PCBs $25. **DRSI** DPK-2 on-board TNC $100. **MFJ**-1270B TNC $140. Steve, VK4YEK (07) 3208 8906. Transmitting gear sold to licensed amateurs only.
- **Yaesu** FT-780R 70cm all-mode xcvr with Tokyo AL-600 amp $550 ono. **Yaesu** FT-290R 2M all-mode xcvr with Tokyo HL35V $450 ono. **Icom** IC-740 HF xcvr $550. **Icom** IC-2KL HF linear with IC-AT500 ATU $2500. Kevin, VK4WA (07) 3814 2480

## VK5 AREA

- **Icom** IC-706 HF+6+2M compact mobile all-mode xcvr. Immac cond, with orig box $1600 ono. John, VK5KBE (08) 8250 7259. Licensed amateurs only.

## VK6 AREA

- **Tubes** 6KD6 matched pair, brand new. **Palomar** TX2250 solid state linear 250w. **Kenwood** IF-232C interface. **Kenwood** IF-10C interface kit. **Kenwood** LF-30A LPF. Graham, VK6WR (08) 9625 1306

## VK7 AREA

- **Complete** Weather fax system incl FRG-7 HF rcvr, IBM compat 386/16 hrdwre, sftwre, peripherals & printer VGC $490. John (03) 6248 6779
- **Icom** IC-720A HF xcvr with manual, VGC $600. Paul, VK7KPG (03) 6372 5305. Licensed amateurs only.
- **Icom** IC-736 HF + 6m xcvr, gen cov rcvr, built-in pwr supp, auto ATU, as new with boxes, books. **Icom** FL-102 AM filt suit IC-760, 761, 765 & 575. Allen, VK7AN (03) 6327 1171 or 041 735 4410. Transmitting gear sold to licensed amateurs only.
- **Swap** 1500VA 240/110V stepdown transformer & Crammond CTR-70A xcvr (suit collector) *for* general cov rcvr, consider anything. Brian (03) 6266 4438

### SWL Club

Australia's best shortwave & scanner listeners club. Eleven 20-page magazines per year. Write to Southern Cross DX Club, GPO Box 1487, Adelaide SA 5001. Sample DX Post magazine FREE. Club WWW page at **http://tolstoi.saccii.net.au/~stephenn**
Email: **scdxc@tolstoi.saccii.net.au**

### Who's Who on the Top Band

- The largest and most up-to-date ranking of top-banders on the Internet by VK2ICV. Dial up **http://www.watch4you.com/160** or E-mail **160@watch4you.com**

## CB radios and antennas, scanners and comms receivers

- **Icom** IC-R8500 comms rcvr/scanner, 6 mths old, $2500. **JRC** NRD-535D comms rcvr, 2 yrs old $2000. **Yaesu** FRG-7700 comms rcvr $400. **Yaesu** FRG-7000 comms rcvr $250. **Icom** IC-R71 comms rcvr $650. **Icom** IC-R10 h/h comms rcvr/scanner $450. EC. Deceased estate. Lee (03) 5250 1105
- **Realistic** DX-160 comms rcvr with orig spkr, works fine $90. John (02) 9525 8901
- **Realistic** PRO-2004 base scanner 25-1300MHz, VGC $320. Also discone to suit $100. The lot $360 neg. Clive, VK2MPX (02) 6947 4151
- **Restoring** Trio 9R-59 rcvr & require valve layout & (hopefully) circ diag for this beauty. Eldon Bryant, PO Box 537, Aitkenvale, QLD 4814 or (077) 75 6579, fax (077) 75 3579. Email Nathan@ bigpond.com
- **Wanted**: manual for Racal rcvr 1217. Alf (02) 9499 2843
- **Wanted**: manual or copy for Yaesu FRG-7000 comms rcvr. Steven (08) 9175 0238 or 041 791 0664
- **Yaesu** FRG-8800 comms rcvr $900. **Yaesu** FRV-8800 $130. **Yaesu** FTA-7700 $130. **Yaesu** FTR-7700 $130. **National** DR48 comms rcvr $400. Luigi 041 224 2130
- **Electrophone** TX-4000 UHF CB, as new $275. **Realistic** PRO-62 with accss, as new $275. Bruce, VK2TNF (02) 9626 5440 or 041 840 9697
- **Electrophone** TX-840A with aerial, mag base, ext spkr $100. **Emtron** EAT-300 ATU $75. **Cobra** 138XLR multi-channel big extras $250. David, VK2DAJ (02) 4885 1470
- **Navaho** base CB with Realistic power mic $200. **Leson** power mic TW-232 with spare h/mic $150. **General Electric** mobile CB with Realistic power mic, spare h/mic $130. All tuned & serviced. John (02) 6686 4493
- **Philips** FM-620 UHF, new in box (no joke!). Greg (02) 6383 9201
- **Sawtron** KG-107 UHF CB with 9dB ant, Sawtron desk mic, two hand mics. UHF CB + POL rx $500. Paul (02) 4329 3939
- **Shack Clearout**. CB AM/SSB 40ch PC-122XLT, brand new, never out of box $200. **Cobra** 146GTL 40ch, almost brand new and almost as good as a 148GTL $200. Ph/fax Len (03) 9775 2575 B/H or email shawlen@mira.net
- **Turner**-type desk mic with compression, brand new in original box, wired to suit Uniden Washington and Grant $90 ono. Mark, VK2HMW ph/fax (02) 9971 0993 or mark@hydra.com.au
- **Uniden** PRO-810E SSB base VGC $100. **American Electronics** SSB 40ch $80. **RCA** Co-Pilot SSB 40ch $80. Robert (02) 4471 5871
- **Wanted**: 'Pony' transportable CB, circa mid-'70s era for historical display. Doesn't have to work. Even the shell will do. Mark, VK3PDG 015 84 4063

### Rarotonga, Cook Islands

Cook Islands Amateur Radio Club, PO Box 663, Rarotonga, Cook Island, South Pacific.

Full Amateur Shack at Club House with excellent antennas available. Club can organize local ZK radio license whilst visiting. Original VK Amateur Operators Certificate of Proficiency must be produced; a copy not acceptable. To obtain your ZK license to operate in the Cook Islands, NZ$20 per annum fee.

Further information from John Abbott, ZK1AX (Club Secretary). Tel. 0011-682-22190, fax 0015-682-20964 or above postal address. General Brochure/details : On visiting the Cook Islands contact Cook Island Tourist Authority, Sydney (02) 9955 0446, fax (02) 9955 0447

***Please note that all phone numbers are after hours unless otherwise noted.***

# AMATEUR REPEATER LIST

The data in this listing has been very kindly supplied to us by the federal WIA. If you think a listing for your area is inaccurate, please let us know. Write to **Repeater Lists**, R&C Magazine, Box 1 Yarra Road, Wonga Park, Victoria 3115, or via Internet email to **randc@tbsa.com.au**. We'll also pass your information on to the WIA.

Sorry, but space limitations prevent us from listing more than input and output frequencies, callsign and location.

| Out MHz | Input MHz | Call | Location |
|---|---|---|---|
| **10 & 6 METRE VOICE REPEATERS** | | | |
| 29.620 | 29.520 | VK2RUW | Knights Hill |
| 29.620 | 29.520 | VK5RHF | Glenside |
| 29.620 | 29.520 | VK5RLZ | Elizabeth Sth |
| 29.640 | 29.540 | VK2RHF | Wagga Wagga |
| 29.640 | 29.540 | VK3RHF | Mt Dandenong |
| 29.640 | 29.540 | VK6RHF | Roleystone |
| 29.660 | 29.560 | VK4RCC | Camp Mountain |
| 29.680 | 29.580 | VK8RDX | Darwin/Manton |
| 53.550 | 52.550 | VK2RAY | Black Range Trig |
| 53.550 | 52.550 | VK2RIC | Parrots Nest |
| 53.550 | 52.550 | VK2RSJ | Kurrajong |
| 53.550 | 52.550 | VK3RMH | Wattle Glen |
| 53.575 | 52.575 | VK2RJB | Sanctuary Point |
| 53.575 | 52.575 | VK2RPW | Nowendoc |
| 53.575 | 52.575 | VK3RDD | Cockatoo |
| 53.600 | 52.600 | VK3RMR | Mt Lookout |
| 53.625 | 52.625 | VK2RSN | Mt Sugarloaf |
| 53.675 | 52.675 | VK2RMB | Terrey Hills |
| 53.675 | 52.675 | VK3RTN | Lake Mountain |
| 53.725 | 52.725 | VK4RGA | Amy's Peak |
| 53.725 | 52.725 | VK4RIK | Mt Haren |
| 53.725 | 52.725 | VK4RLB | Logan City |
| 53.750 | 52.750 | VK5RDX | Chandlers Hill |
| 53.775 | 52.775 | VK4RAF | Black Mountain |
| 53.775 | 52.775 | VK4RRC | Mount Mee |
| 53.800 | 52.800 | VK6RTH | Tic Hill |
| 53.825 | 52.825 | VK7RMD | Mt Duncan |
| 53.850 | 52.850 | VK2RWI | Dural |
| 53.900 | 52.900 | VK3RMS | Olinda |
| 53.925 | 52.925 | VK8RDX | Darwin/Manton |
| 53.950 | 52.950 | VK4RBL | Bardon |
| 53.975 | 52.975 | VK3RGM | Mt Buller |
| 53.975 | 52.975 | VK4RBR | Mount Gravatt |
| **TWO METRE VOICE REPEATERS** | | | |
| **ACT and New South Wales** | | | |
| 146.625 | 146.025 | VK2RBB | Byron Bay |
| 146.625 | 146.025 | VK2RLD | The Oaks |
| 146.650 | 146.050 | VK2RCH | Mount Coramba |
| 146.650 | 146.050 | VK2RDX | Mount Bindo |
| 146.650 | 146.050 | VK2RMI | Terry Hie Hie |
| 146.650 | 146.050 | VK2RMV | Mt Victoria |
| 146.675 | 146.075 | VK2RCV | South Grafton |
| 146.675 | 146.075 | VK2RRE | Taree |
| 146.675 | 146.075 | VK2RTY | Blacktown |
| 146.700 | 146.100 | VK2RAO | Mount Canobolas |
| 146.700 | 146.100 | VK2RMU | Little Forest |
| 146.700 | 146.100 | VK2RPM | Port Macquarie |
| 146.725 | 146.125 | VK2RAG | Somersby |
| 146.750 | 146.150 | VK2RPC | Kurrajong 123Hz tone |
| 146.750 | 146.150 | VK2RFS | Mount Mumbulla |
| 146.750 | 146.150 | VK2RTM | Mount Crawney |
| 146.750 | 146.150 | VK2RWG | Mount Flackney |
| 146.775 | 146.175 | VK2RTZ | Mt Sugarloaf |
| 146.800 | 146.200 | VK2RCC | Needle Mountain |
| 146.800 | 146.200 | VK2RIC | Parrots Nest |
| 146.800 | 146.200 | VK2RLE | Heathcote |
| 146.800 | 146.200 | VK2RTD | Kendall Trig |
| 146.825 | 146.225 | VK2RET | Bundook Mountain |
| 146.825 | 146.225 | VK2RHR | High Range |
| 146.850 | 146.250 | VK2RMP | Maddens Plains |
| 146.850 | 146.250 | VK2RGF | Mount Bingar |
| 146.875 | 146.275 | VK2RMB | Terrey Hills |
| 146.875 | 146.275 | VK2RMC | Yarrahappini Kempsey |
| 146.875 | 146.275 | VK2RZL | Mount Arthur |
| 146.900 | 146.300 | VK1RAC | Black Hill |
| 146.900 | 146.300 | VK2RAN | Mount Sugarloaf |
| 146.900 | 146.300 | VK2RRT | Boona Mountain |
| 146.925 | 146.325 | VK2RGR | North Ryde |
| 146.925 | 146.325 | VK2RPW | Nowendoc |
| 146.950 | 146.350 | VK1RGI | Mount Ginini |
| 146.950 | 146.350 | VK2RNE | Mount Rumbee |
| 146.975 | 146.375 | VK2RAN | Mt Sugarloaf |
| 146.975 | 146.375 | VK2RIS | Saddleback Mountain |
| 146.975 | 146.375 | VK2RMS | Bald Hill |
| 147.000 | 146.400 | VK2RBH | Broken Hill |
| 147.000 | 146.400 | VK2RWI | Dural |
| 147.025 | 147.625 | VK2ROT | Paddington |
| 147.050 | 147.650 | VK2RBM | Mount Druitt |
| 147.075 | 147.675 | VK2RCZ | Lalor Park |
| 147.075 | 147.675 | VK2RPW | Nowendoc |
| 147.075 | 147.675 | VK2RWR | Moona Trig |
| 147.100 | 147.700 | VK2RGL | Cabbage Tree Mt |
| 147.100 | 147.700 | VK2RWM | Grenfell |
| 147.100 | 147.700 | VK2RZL | Mount Arthur |
| 147.125 | 147.725 | VK2RER | Bulloc Bulloc Hill |
| 147.150 | 147.750 | VK2RWS | Chatswood |
| 147.200 | 147.800 | VK2RHW | Mount Woolooma |
| 147.200 | 147.800 | VK2RSD | Mount Cambewarra |
| 147.225 | 147.825 | VK2RST | Lane Cove |
| 147.225 | 147.825 | VK2RYL | Bald Mountain |
| 147.250 | 147.850 | VK2RNS | Asquith |
| 147.275 | 147.775 | VK2RFT | Forster |
| 147.275 | 147.775 | VK2RIL | Sublime Point |
| 147.275 | 147.775 | VK2RMO | Mount Baldwin |
| 147.325 | 147.925 | VK2RTS | Lawson |
| 147.925 | 147.325 | VK2RGN | Mount Gray |
| **Victoria** | | | |
| 146.650 | 146.050 | VK3REG | Donald's Knob |
| 146.650 | 146.050 | VK3RGV | Mount Wombat |
| 146.700 | 146.100 | VK3RML | Ferny Creek |
| 146.700 | 146.100 | VK3RNC | Mount Mittamatite |
| 146.700 | 146.100 | VK3RON | Ouyen |
| 146.750 | 146.150 | VK3RBA | Mount Buninyong |
| 146.775 | 146.175 | VK3RAG | Rennies Hill |
| 146.800 | 146.200 | VK3RLV | Mount Tassie |
| 146.800 | 146.200 | VK3RMA | Mildura |
| 146.850 | 146.250 | VK3RMN | Kinglake |
| 146.875 | 146.275 | VK3ROK | Mount Bullengarook |
| 146.900 | 146.300 | VK3RBS | Smeaton Hill |
| 146.900 | 146.300 | VK3REB | Mount Nowa Nowa |
| 146.900 | 146.300 | VK3RSH | Swan Hill |
| 146.950 | 146.350 | VK3RWZ | Mount William |
| 146.975 | 146.375 | VK3RSR | Scouts portable |
| 147.000 | 146.400 | VK3RGL | Mount Anakie |
| 147.000 | 146.400 | VK3RNE | Mount Big Ben |
| 147.025 | 147.625 | VK3RGS | Mount Fatigue |
| 147.025 | 147.625 | VK3RMK | Mount Kerang |
| 147.050 | 147.650 | VK3RHO | Mount Hotham |
| 147.050 | 147.650 | VK3RVL | Robinvale |
| 147.050 | 147.650 | VK3RWL | Mount Warrnambool |
| 147.075 | 147.675 | VK3RCR | Heathmont |
| 147.100 | 147.700 | VK3RPB | Mount Porepunkah |
| 147.100 | 147.700 | VK3RSG | Bass Hill |
| 147.125 | 147.725 | VK3RGC | Montpelier |
| 147.150 | 147.750 | VK3RCV | Mount Alexander |
| 147.175 | 147.775 | VK3REC | Olinda |
| 147.225 | 147.825 | VK3RWG | Mount Baw Baw |
| 147.250 | 147.850 | VK3RMM | Mount Macedon |
| 147.275 | 147.875 | VK3ROW | Beech Forest |
| **Queensland** | | | |
| 146.625 | 146.025 | VK4RGT | Maurice Hill |
| 146.625 | 146.025 | VK4RGY | Mount Boulder |
| 146.650 | 146.050 | VK4ROM | Grafton Range |
| 146.675 | 146.075 | VK4RET | Mount Kiangrow |
| 146.675 | 146.075 | VK4RTA | Longlands Gap |
| 146.700 | 146.100 | VK4RAR | Mount Archer |
| 146.700 | 146.100 | VK4RAT | Mount Stuart |
| 146.700 | 146.100 | VK4RGC | Springbrook |
| 146.700 | 146.100 | VK4RMI | Four Mile Hill |
| 146.725 | 146.125 | VK4RSB | Mount Gordon |
| 146.750 | 146.150 | VK4RDD | Mount Lofty |
| 146.800 | 146.200 | VK4RBU | Mt Goonaneman |
| 146.800 | 146.200 | VK4RTI | Thursday Island |
| 146.800 | 146.200 | VK4RWP | Weipa |
| 146.825 | 146.225 | VK4RCR | Dalveen |
| 146.850 | 146.250 | VK4RHT | Hann Tableland |
| 146.850 | 146.250 | VK4RLE | Longreach |
| 146.850 | 146.250 | VK4RSC | Buderim |
| 146.875 | 146.275 | VK4RBS | Alexandra Hills |
| 146.875 | 146.275 | VK4RTB | Mount Tabletop |
| 146.900 | 146.300 | VK4RAI | Mt Stradbroke |
| 146.900 | 146.300 | VK4RGA | Amy's Peak |
| 146.925 | 146.325 | VK4RHR | Hodgson Range |
| 146.925 | 146.325 | VK4RRC | Mount Mee |
| 146.950 | 146.350 | VK4RBD | Blackdown T'ld |
| 146.950 | 146.350 | VK4RCA | Bellenden Ker |
| 146.950 | 146.350 | VK4RGG | Nerang |
| 146.975 | 146.375 | VK4RRR | Blue Mountain |
| 147.000 | 146.400 | VK4RBN | Mount Glorious |
| 147.000 | 146.400 | VK4RMK | Black Mountain |
| 147.150 | 147.750 | VK4RAG | Spring Hill |
| 147.175 | 147.775 | VK4RWM | Ipswich |
| 147.300 | 147.900 | VK4RQT | Mount Glorious |
| 147.325 | 147.925 | VK4REP | Middlemount |
| 147.350 | 147.950 | VK4REP | Middlemount |
| 147.350 | 147.950 | VK4RII | Mt Inkerman Burde |
| 147.375 | 147.975 | VK4REP | Middlemount |
| 147.375 | 147.975 | VK4RMO | Coominglah Monto |
| 147.375 | 147.975 | VK4RWB | Mount Bertha |
| 147.625 | 147.025 | VK4RMV | Westwood Range |
| 147.650 | 147.050 | VK4RBT | Mount Cotton |
| 147.675 | 147.075 | VK4RBT | Mount Cotton |
| 147.800 | 147.200 | VK4RBG | Bundaberg |
| 147.825 | 147.225 | VK4REG | Kallangur Hts |
| 147.850 | 147.250 | VK4RCB | Mount Devlin |
| 147.950 | 147.350 | VK4RLR | Rockhampton |
| **South Australia** | | | |
| 146.625 | 146.025 | VK5RLZ | Elizabeth South |
| 146.650 | 146.050 | VK5RNC | Naracoorte |
| 146.675 | 146.075 | VK5RSV | Willunga |
| 146.700 | 146.100 | VK5RMN | The Bluff |
| 146.750 | 146.150 | VK5RAC | Pillaworta Hill |
| 146.800 | 146.200 | VK5REP | Coolanie |
| 146.825 | 146.225 | VK5RBV | Angaston |
| 146.850 | 146.250 | VK5RHO | Houghton |
| 146.900 | 146.300 | VK5RMG | The Bluff |
| 146.925 | 146.325 | VK5RLH | Bumbunga Hill |
| 147.000 | 146.400 | VK5RAD | Crafers |
| 147.825 | 147.825 | VK5RBG | Roseworthy |

| | | | |
|---|---|---|---|
| 147.875 | 147.275 | VK5RAE | Mount Arden |
| 147.925 | 147.325 | VK5RLD | Berri |
| 147.925 | 438.575 | VK5RLD | Berri |

### Western Australia

| | | | |
|---|---|---|---|
| 146.625 | 146.025 | VK6RNC | Wanneroo |
| 146.650 | 146.050 | VK6RBY | Bunbury |
| 146.675 | 146.075 | VK6RNR | Hudgejah |
| 146.675 | 146.075 | VK6RCA | Whim Creek |
| 146.700 | 146.100 | VK6RAP | Roleystone |
| 146.700 | 146.100 | VK6RWR | Wickham |
| 146.725 | 146.125 | VK6RAL | Albany |
| 146.750 | 146.150 | VK6RAT | Forbs Hill |
| 146.750 | 146.150 | VK6RLM | Lesmurdie |
| 146.750 | 146.150 | VK6RES | Esperance |
| 146.800 | 146.200 | VK6RTH | Tic Hill |
| 146.800 | 146.200 | VK6RWP | Karratha |
| 146.825 | 146.225 | VK6RAA | Mt Barker |
| 146.850 | 146.250 | VK6REX | Exmouth |
| 146.850 | 146.250 | VK6RKB | Kambalda |
| 146.900 | 146.300 | VK6RMW | Mount William |
| 146.950 | 146.350 | VK6RFM | Attadale |
| 146.950 | 146.350 | VK6RSG | Goldsworthy |
| 147.000 | 146.400 | VK6RAW | Fairfield |
| 147.000 | 146.400 | VK6RAK | Kalgoorlie |
| 147.000 | 146.400 | VK6RGN | Geraldton |
| 147.000 | 146.400 | VK6RNW | Port Hedland |
| 147.150 | 147.750 | VK6RMJ | Manjimup |
| 147.200 | 147.800 | VK6RCT | Yandan Hill |
| 147.250 | 147.850 | VK6RMS | Mount Saddleback |
| 147.275 | 147.875 | VK6RAV | Crows Nest, Northam |
| 147.350 | 147.950 | VK6RBN | Chapman Hill |

### Tasmania

| | | | |
|---|---|---|---|
| 146.625 | 146.025 | VK7RMD | Mount Duncan |
| 146.650 | 146.050 | VK7RAF | Mount Faulkner |
| 146.700 | 146.100 | VK7RHT | Guy Fawkes Hill |
| 146.725 | 146.125 | VK7RNE | Tower Hill, St Marys |
| 146.750 | 146.150 | VK7RNW | Lonah |
| 146.900 | 146.300 | VK7REC | Snow Hill |
| 147.000 | 146.400 | VK7RAA | Mount Barrow |
| 147.075 | 147.675 | VK7RWC | Mount Read |

### Northern Territory

| | | | |
|---|---|---|---|
| 146.650 | 146.050 | VK8RMS | Nhulunbuy |
| 146.700 | 146.100 | VK8RDA | Palmerston |
| 146.800 | 146.200 | VK8RWI | WICEN portable |
| 146.950 | 146.350 | VK8RCA | West Gap |
| 147.000 | 146.400 | VK8RTE | Darwin |

## 70 AND 23cm VOICE REPEATERS

### ACT and New South Wales

| | | | |
|---|---|---|---|
| 438.025 | 433.025 | VK2RCH | Coffs Harbour |
| 438.025 | 433.025 | VK2RHR | High Range |
| 438.075 | 433.075 | VK2RAG | Gosford-Wyong |
| 438.125 | 433.125 | VK2RMU | Milton |
| 438.175 | 433.175 | VK2RMB | Sydney |
| 438.175 | 433.175 | VK2RNT | Armidale |
| 438.225 | 433.225 | VK2RPW | Walcha |
| 438.225 | 433.225 | VK2RUW | Illawarra |
| 438.275 | 433.275 | VK2RWS | Chatswood WICEN |
| 438.325 | 433.325 | VK2REE | Taree |
| 438.325 | 433.325 | VK2RGN | Goulburn |
| 438.325 | 433.325 | VK2RWM | Grenfell |
| 438.375 | 433.375 | VK1RIR | Canberra |
| 438.375 | 433.375 | VK2RUT | Sydney West |
| 38.425 | 433.425 | VK2RCN | Oxley Region |
| 38.425 | 433.425 | VK2RUH | Hurstville |
| 38.475 | 433.475 | VK2RRS | Lane Cove |
| 38.525 | 433.525 | VK1RGI | Mt Ginini |
| 38.525 | 433.525 | VK2RPM | Port Macquarie |
| 38.525 | 433.525 | VK2RWI | Dural |
| 38.575 | 433.575 | VK2RAY | Albury |
| 38.625 | 433.625 | VK2RGN | Goulburn |
| 38.625 | 433.625 | VK2RUM | Newcastle |
| 38.675 | 433.675 | VK2RAN | Newcastle |
| 38.675 | 433.675 | VK2RSC | Lismore / Casino |
| 438.675 | 433.675 | VK2RTW | Wagga |
| 438.725 | 433.725 | VK2RMP | Maddens Plains |
| 439.275 | 434.275 | VK2RSM | Saddleback Mountain |
| 439.325 | 434.325 | VK2RTY | Sydney RTTY |
| 439.375 | 434.375 | VK2RTM | Tamworth |
| 439.425 | 434.425 | VK2RCZ | Lalor Park |
| 439.475 | 434.475 | VK2ROT | Paddington |
| 439.525 | 434.525 | VK2RON | North Ryde |
| 439.575 | 434.575 | VK2RJB | Jervis Bay |
| 439.575 | 434.575 | VK2RMR | Mt Riverview |
| 439.625 | 434.625 | VK2RLD | Razorback Range |
| 439.950 | 434.950 | VK2RAG | Gosford |
| 1273.05 | 1293.05 | VK2RLD | Razorback Range |
| 1273.20 | 1293.20 | VK2RPW | Nowendoc |
| 1273.75 | 1293.75 | VK2RWI | Dural |
| 2449.00 | 2429.00 | VK2RWI | Dural |

### Victoria

| | | | |
|---|---|---|---|
| 438.025 | 433.025 | VK3RCC | Melbourne City |
| 438.075 | 433.075 | VK3RMU | Mt St Leonard |
| 438.175 | 433.175 | VK3RUG | Eildon |
| 438.225 | 433.225 | VK3ROU | Melbourne |
| 438.275 | 433.275 | VK3RWE | WICEN portable |
| 438.325 | 433.325 | VK3RMH | Wattle Glen |
| 438.375 | 433.375 | VK3RGU | Carrajung |
| 438.425 | 433.425 | VK3RCU | Bendigo |
| 438.475 | 433.475 | VK3RBU | Ballarat |
| 438.525 | 433.525 | VK3RAD | Mitcham |
| 438.525 | 433.525 | VK3RNU | Wangaratta |
| 438.525 | 433.525 | VK3RRU | Merbein |
| 438.625 | 433.625 | VK3RWI | WICEN portable |
| 438.675 | 433.675 | VK3RWU | Grampians |
| 438.700 | 433.700 | VK3REO | St Albans |
| 438.750 | 433.750 | VK3RHF | Mt Olinda |
| 439.275 | 434.275 | VK3RMM | Melbourne WICEN |
| 439.375 | 434.375 | VK3RSE | Melbourne |
| 439.425 | 434.425 | VK3RNE | Wodonga |
| 439.425 | 434.425 | VK3RSU | Chesney Vale |
| 439.575 | 434.575 | VK3RGL | Geelong |
| 439.625 | 434.625 | VK3RDK | Bayswater |
| 439.675 | 434.675 | VK3RZU | Mt Buller |
| 439.725 | 434.725 | VK3RPU | Arthur's Seat |
| 439.775 | 434.775 | VK3RGV | Goulburn Valley |
| 439.875 | 434.875 | VK3RDU | Shepparton |
| 1273.10 | 1293.10 | VK3RCC | Melbourne City |
| 1273.15 | 1293.15 | VK3REO | St Albans |
| 1273.25 | 1293.25 | VK3ROK | Mt Bullengarook |
| 1273.40 | 1293.40 | VK3RDK | The Basin |

### Queensland

| | | | |
|---|---|---|---|
| 438.025 | 433.025 | VK4RMO | Monto |
| 438.025 | 433.025 | VK4RTQ | Mt Tambourine |
| 438.075 | 433.075 | VK4RSC | Buderim |
| 438.225 | 433.225 | VK4RAT | Townsville |
| 438.225 | 433.225 | VK4RDG | Central Qld Coast |
| 438.225 | 433.225 | VK4RGC | Gold Coast |
| 438.325 | 433.325 | VK4RCC | Redcliffe |
| 438.325 | 433.325 | VK4RRC | Wamuran |
| 438.375 | 433.375 | VK4RWM | Ipswich |
| 438.425 | 433.425 | VK4RMU | Mackay |
| 438.475 | 433.475 | VK4RXX | Brisbane |
| 438.500 | 433.500 | VK4RHR | Clermont |
| 438.500 | 433.500 | VK4RXG | Brisbane |
| 438.525 | 433.525 | VK4RBC | Brisbane |
| 438.625 | 433.625 | VK4RAG | Brisbane |
| 438.625 | 433.625 | VK4RWI | WICEN portable |
| 438.700 | 433.700 | VK4RET | Dalby |
| 438.775 | 433.775 | VK4RBU | Bundaberg |
| 438.825 | 433.825 | VK4RGY | Gympie |
| 438.875 | 433.875 | VK4RMC | Gympie |
| 438.950 | 433.950 | VK4RBA | Redbank |
| 439.275 | 434.275 | VK4RDU | Toowoomba |
| 439.350 | 434.350 | VK4RIK | Cairns |
| 439.900 | 434.900 | VK4REX | Maleny |
| 439.950 | 434.950 | VK4RIY | Toowoomba |
| 1281.65 | 1293.65 | VK4REX | Maleny |

### South Australia

| | | | |
|---|---|---|---|
| 438.075 | 433.075 | VK5RDX | Chandlers Hill |
| 438.325 | 433.325 | VK5ROH | Mt Gambier |
| 438.425 | 433.425 | VK5RBV | Angaston |
| 438.475 | 433.475 | VK5RLZ | Elizabeth |
| 438.525 | 433.525 | VK5RAD | Crafers |
| 438.525 | 433.525 | VK5RVP | Adelaide |
| 1281.55 | 1293.55 | VK5RLZ | Elizabeth |
| 1293.25 | 1281.25 | VK5RWH | Adelaide |

### Western Australia

| | | | |
|---|---|---|---|
| 438.225 | 433.225 | VK6RTH | Perth |
| 438.525 | 433.525 | VK6RMS | Boddington |
| 438.525 | 433.525 | VK6RUF | Perth |
| 438.575 | 433.575 | VK6RFH | Perth |
| 438.675 | 433.675 | VK6RBN | Busselton |
| 439.500 | 434.500 | VK6RFI | Perth |
| 439.875 | 434.875 | VK6RWL | Perth |

### Tasmania

| | | | |
|---|---|---|---|
| 438.500 | 433.500 | VK7RIN | Barren Tier |
| 438.525 | 433.525 | VK7RAH | Portable |
| 438.550 | 433.550 | VK7RAB | Mt Arthur |
| 438.600 | 433.600 | VK7RNW | Lonah |
| 438.600 | 433.600 | VK7RTC | Hobart |
| 438.650 | 433.650 | VK7RAC | Table Cape |

### Northern Territory

| | | | |
|---|---|---|---|
| 438.275 | 433.275 | VK8RDU | Darwin |
| 438.525 | 433.525 | VK8RIT | Alice Springs |

## ATV REPEATERS

### ACT and New South Wales

| | | | |
|---|---|---|---|
| 426.250 | 444.250 | VK2RTW | Wagga |
| 444.250 | 426.250 | VK2RTG | Gosford |
| 444.250 | 1250.00 | VK2RWI | Dural |
| 576.250 | 1250.00 | VK2RFM | Oakdale |
| 576.250 | 426.250 | VK2RTS | Blue Mountains |
| 576.250 | 444.250 | VK2RTV | Lane Cove |
| 1250.00 | 426.250 | VK2RAG | Gosford |
| 1250.00 | 426.250 | VK2RFM | Oakdale |
| 1250.00 | 444.250 | VK2RFM | Oakdale |
| 1250.00 | 444.250 | VK2RTS | Blue Mountains |
| 1253.25 | 444.250 | VK2RTS | Blue Mountains |

### Victoria

| | | | |
|---|---|---|---|
| 444.250 | 426.250 | VK3REX | Swan Hill |
| 426.250 | 444.250 | VK3RMZ | Bendigo |
| 579.250 | 444.250 | VK3RNE | Wodonga |
| 579.250 | 444.250 | VK3RTV | Melbourne |

### Queensland

| | | | |
|---|---|---|---|
| 444.250 | 1250.00 | VK4RAT | Townsville |
| 579.250 | 444.250 | VK4RTV | Brisbane |
| 1250.00 | 579.250 | VK4RRP | SW Brisbane/Ipswich |

### South Australia

| | | | |
|---|---|---|---|
| 444.250 | 426.250 | VK5RCN | Central North |
| 579.250 | 426.250 | VK5RTV | Adelaide |
| 1286.25 | 444.250 | VK5RWH | Adelaide |
| 1250.00 | 444.250 | VK5RWH | Adelaide |
| 2372.00 | 1250.00 | VK5RLZ | Elizabeth |

### Western Australia

| | | | |
|---|---|---|---|
| 444.250 | 426.250 | VK6RTV | Edith Cowan Uni |
| 444.250 | 1242.25 | VK6RTV | Edith Cowan Uni |
| 444.250 | 1250.00 | VK6RTV | Edith Cowan Uni |
| 579.250 | 444.250 | VK6RTX | Perth |
| 1242.25 | 444.250 | VK6RTV | Edith Cowan Uni |
| 1250.00 | 444.250 | VK6RTV | Edith Cowan Uni |

### Tasmania

| | | | |
|---|---|---|---|
| 426.250 | 444.250 | VK7RMD | Mt Duncan |
| 579.250 | 444.250 | VK7RAE | Kelcy Tiers |

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## Yaesu FT-2200 2m Mobile

A compact, fully featured 2m FM transceiver providing selectable power output of 5, 25 or 50 watts, it includes the latest convenience features for more enjoyable mobile or base station operation.

- 49 tuneable memories
- Choice of scanning modes
- "Instant recall" CALL channel
- 7 user-selectable channel steps
- Back-lit LCD screen and knobs
- 38 tone CTCSS encoder
- DTMF based paging & selective calling with Auto-Page/Forwarding
- 10 DTMF auto-dial memories
- Supplied with microphone, mounting bracket & DC power lead.

D 3635

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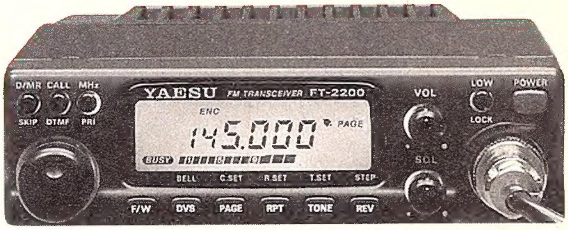
***2 YEAR WARRANTY***


D/MR CALL MHz
YAESU FM TRANSCEIVER FT-2200
SKIP DTMF PRI
ENC
145.000
PAGE
BUSY
VOL
LOW
POWER
LOCK
SQL
BELL C.SET R.SET T.SET STEP
F/W DVS PAGE RPT TONE REV

### *General Specifications*

| | |
|---|---|
| Frequency: | 144 to 148MHz |
| Channel steps: | 5, 10, 12.5, 15, 20, 25, 50kHz |
| Dimensions: | 140 x 40 x 160mm without knobs |

### *Receiver Specifications*

| | |
|---|---|
| Sensitivity: | Better than 0.21uV for 12dB SINAD |
| Intermediate frequency: | 17.7MHz and 455kHz |
| Image rejection: | Better than 65dB |
| Maximum AF output: | 1.5W into 8 ohms at 5% THD |

## FT-8500 Deluxe 2m/70cm Mobile

Get a great clearance price on our remaining stock! The FT-8500 2m/70cm FM transceiver provides the advantages of a large remotable Omni-Glow display with all major controls on an easy to use hand microphone, and MIL-STD 810C ruggedness.

It also provides three dual-band receive configurations (VHF+VHF, UHF+UHF, VHF+UHF), allowing cross-band full-duplex as well as standard single band operation. A unique Spectra-Analyzer with selectable channel and indicator widths shows station activity and relative signal strength above and below the current operating frequency or selected memory bank. Simple menu programming with alphanumeric labelling also covers most transceiver functions. Other features include:

- Rear panel socket for 1200 and 9600 baud packet operation
- 110 memory channels for storage of your favourite frequencies
- Inbuilt CTCSS encoder
- Selectable battery voltage readout

D 3318

**$799**

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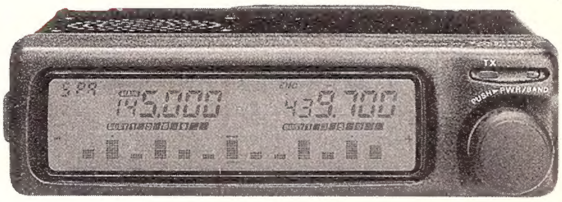

- Meets MIL-STD 810/C shock and vibration rating
- Supplied with MH-39 hand mic, DC power lead and comprehensive instruction manual

### Specifications:

| | |
|---|---|
| Frequency range: | Tx 144-148, 430-450MHz<br>Rx 110-174, 300-500MHz |
| RF Output: | 2m - 50, 10, 5W<br>70cm - 35, 10, 5W |
| Sensitivity (HAM bands): | 0.18uV (Main Rx), 0.25uV (Sub Rx) |
| Dimensions: | 140 x 40 x 160mm (WHD) |

**BONUS YSK-8500**
**Remote Front Panel Kit** D 3319

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# Yaesu's Done It Again

## FT-920 HF/6m Transceiver With DSP

Now there's no excuse for not taking advantage of the latest advances in Digital Signal Processing, transceiver design plus the fun of 6m operation. The stunning new Yaesu FT-920 is a high performance HF/6m multi-mode receiver that provides 100W PEP output on the 160-6m bands, incredible front-end performance based on the FT-1000MP design, and a huge array of features that make it a pleasure to use.

At first glance Yaesu's renowned Omni-Glow LCD screen is obvious, and its wide-angle view provides a wealth of information about the transceiver's operating status with multi-function metering, dual frequency displays and an Enhanced Tuning scale for DSP bandwidth, CW tuning, FM discriminator and more. Inside, the FT-920 is built around a rugged diecast unibody chassis which provides excellent heatsinking for the low distortion dual MRF255 160-6m FET power amplifier.

For more comfortable operating when weaker signals are present Yaesu's engineers dedicated themselves to enhancement of real-world signal to noise ratios, and after thousands of hours of design and testing have produced an industry-leading 33.3MIPS (millions of instructions per second) processing speed DSP in the FT-920 that provides a two-parameter noise reduction system with 32 steps of front panel adjustment. This amazing system also provides dual control DSP passband tuning, DSP auto-notch filter, an amazing new transmit Digital Speech Processor, DSP mic equalisation, fast acting DSP VOX circuitry as well as a Contest-ready Digital Voice Recorder!

Other features include an all-band (160-6m) auto antenna tuner which also provides greater receiver band-pass protection, Direct Digital Synthesis for clean local oscillators, selectable frequency-optimised receiver front-end pre-amps, and a Shuttle Jog tuning ring for fast QSY. A Dual Watch receive system allows you to check for band openings, especially handy when monitoring 6m. Also provided are SSB/CW/FM operation (AM with optional filter), 127 memories with alphanumeric labelling, IFshift and IF noise blanker to fight interference, plus an extensive menu system for selecting most "set and forget" functions.

The FT-920 is supplied with an MH-31B8 hand mic, DC power lead and comprehensive instruction manual.

Why not call for a copy of the Yaesu 6 page FT-920 colour brochure to learn more about this efficient transceiver that's without peer in its price class.

D 3420

YAESU

**2 YEAR WARRANTY**

**$2995**

**BONUS**

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Power supply valued at $299
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